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THE LONDON NATURALIST

the journal of the
LONDON NATURAL HISTORY SOCIETY

No 55

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LONDON NATURAL HISTORY SOCIETY

WHATEVER your interest in natural history—beginner or expert— the Society will welcome you as a member. You are offered a wonderful opportunity of extending your knowledge and increasing your enjoyment. The Society's Area lies within a 32 km (20-mile) radius of St Paul's and here most of its activities take place. Although so much of the area is covered with bricks and mortar it is a most exciting region with an astonishing variety of fauna and flora. The Society consists of sections whose meetings are open to all members without formality. If you are interested in archaeology, botany, ecology, entomology, geology, mammalogy, ornithology, rambling, or if you are a young naturalist, there is a section ready to help you.

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for the year 1975

Edited by J. R. Laundon
with the assistance of
R. M. Burton and K. H. Hyatt

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Report of the Society for 1975*

This year has seen much work by the Council and its members. Our former President, Mr K. H. Hyatt, set up a working party to examine ways of improving the society. Early this year, the working party presented its report and this has been discussed extensively by Council. The decisions taken may not prove dramatic, but it is hoped that a rationalization will result.

Inflation is, yet again, taking its toll, and the society has had no option but to increase its subscriptions. This had been long overdue, but it is hoped that we shall be able to pay our way without a further increase in the near future. We hope the membership will understand our dilemma and stay loyal. It is only through a large and active membership that we can hope to remain solvent. Partly to this end, a post of Publicity Secretary has been established, and a campaign of publicity is being initiated with new literature and brochures. A society symbol, a sparrow in silhouette, has been introduced.

The membership has decreased slightly from last year, but it is encouraging to see a slight increase in the junior category.

Ordinary members	1,047
Subscriber members	23
Senior members	28
Family members	85
Junior members	65
Honorary members	14
Life members	15
Total	1,277

It is with regret that we record the deaths of Lord Hurcomb, Miss E. Boxall, R. G. Miles, R. H. May, J. F. Perrin, B. H. F. Whyman and Miss M. Ward.

The more insidious effect of inflation is the decrease in attendance at meetings. We have been returning to more central venues—at prohibitive costs—but the turn-out is still low. The quality of the lectures and field meetings have, as always, been high, and we thank all those, both members and non-members, who have taken the effort to entertain and enlighten us. This year, we have initiated, following the suggestion of Mr J. E. Lousley, a full day conference which will follow our Annual General Meeting. We hope this will become an annual event.

The loss of members may mean that the fate of some smaller sections may be in jeopardy, but it is hoped, nevertheless, to retain the interests which they pursued.

We thank again Imperial College for allowing us to use its rooms for meetings, both for business and lectures; and also Mr Whitworth, the College Librarian, and his staff for the custody of our library. The books are now accessible and it is hoped that a catalogue of our collection may soon be forthcoming.

The *Society Newsletter* continues, thanks to the efforts of Mr A. M. Hutson, the Editor, and his team of workers.

In conclusion, our thanks are extended to all officers, committee members and to all members and friends for their continued help and support.

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* Presented at the Annual General Meeting, 13 December 1975.

Hemiptera - Heteroptera of the London Area

PART X

by Eric W. Groves*

(Previous parts of this paper have appeared in *The London Naturalist* as follows: Pt. I (**43**: 34–66, 1964); Pt. II (**44**: 82–110, 1965); Pt. III (**45**: 60–88, 1966); Pt. IV (**46**: 82–104, 1967); Pt. V (**47**: 50–80, 1968); Pt. VI (**48**: 86–120, 1969); Pt. VII (**50**: 87–94, 1972); Pt. VIII (**52**: 31–59, 1973); and Pt. IX (**54**: 21–34, 1975). A continuing list of abbreviations as to sources of records and for recorders' names has appeared whenever appropriate at the beginning of the parts listed above).

MIRIDAE (Capsid bugs) (*Contd*)

Subfamily: MIRINAE (*Contd*)

Phytocoris tiliae (Fab.) Sp. 395 p. 296

D & S p. 303 S. p. 233 B. p. 382 (Sp. 271)

Common. Occurs on many deciduous trees particularly oak, elm and lime. It overwinters in the egg stage; the eggs, according to D. C. Thomas (12), being laid at night in the bark of small branches on the host tree during August. The green and black larvae hatch at intervals from the beginning of June until early August but those of later broods overlap with the adults which may be found on the leaves, branches and trunk from July to the end of September.

Middx. Buckingham Palace grounds, 1961, on hawthorn and holly, *TRES* (52); garden in north London, viii.1884, on trunk of lime tree, *EAB* (BM); St John's Wood (Finchley Road), N.W.8, 10.vii.52, 15.vii.61, 16.vii.52, 16.vii.60 (on *Tilia*), 19.vii.50, 27.vii.61, 30.vii.60, all taken in garden, *DL* (HD) (54); 1.viii.51, feeding on puparium of *Adalia* sp.; *DL* (HD); 1.viii.51 on *Tilia*, *DL* (54) (EMM **87**, 270); 11.viii.60, *DL* (54); Hampstead, 21.viii.60, *RGA* (BM); Hampstead Heath, 12.vi.43, on oak and *Pinus sylvestris*, *CHA* (17); 5.viii.60, *DL* (HD) (54); (West Heath), 14.viii.49, on oak, rather local, *DL* (HD) (54) (1/1949–50, 36–38); Finchley, 16.vii.43, on *Crataegus*, *CHA* (17); vii.46, on apple, *CHA* (17); Edgware (Scratch Wood), 23.vii.60, *DL* (HD) (54); Ruislip LNR, 2.viii.64, fairly common on birch, *RAPM* (49); 8.viii.64, on ash, *RAPM* (49); 9.ix.58 ♀ on oak, *EWG* (49) (24); and Hounslow Heath, 16.ix.52, *GEW* per *DL* (54).

Herts. Whetstone, vii.60, 17, 28 & 29.viii.60 ♂♂, and 3.ix.60 ♂, taken in M.V. light trap, *PHW* (*pers. comm.*) and (47); Boreham Wood, 18.ix.60, on elm, *DL* (54); Rickmansworth, 18.viii.16, *EAB* (BM); Chorley Wood, 16.viii.16, adults and IV & II instar larvae, *EAB* (BM) (11); Bricket Wood, 16.ix.22, ♂, *ECB* (NM); Hatfield, 1.x.1891, *EAB* (BM); and just over the boundary at Harpenden, 1933–36, taken in light trap in Rothamsted Expt. Station grounds, *DCT* (59); 5.vii.55 & 7.ix.54, *GGES* (HD).

Essex. Woodford, 5.viii.25, V instar larva and 7.viii.25 adult, *EAB* (BM); Hale End, ix.1891, *EAB* (BM); Buckhurst Hill, 18.viii.25, *EAB* (BM); Chingford, ix.1867, *EAB* (BM); ix.07, *EAB* (BM); Epping Forest, generally distributed, *CN* (35a); 6.ix.20 ♀, *ECB* (NM); (Loughton), 14.viii.25, *EAB* (BM); and beyond the boundary at Writtle, viii.53, *JHF* (42).

Kent. Blackheath, *JAP* (BM); 15.vii.1895, *AJC* (HD); *WW* (4) (22); 30.viii.36, *FJC* (SL); (garden at 63 Blackheath Park), 8.viii.58 & 18.viii.62, several on beech hedge, on plum and other fruit trees, etc., and on the trunks, 'often seen in nymphal stage in July', *AAA* (51); common at light up to well in October (e.g. 12.x.59), *AAA* (51); Shooters Hill in woods fringing Eltham Common, 13.ix.60, rather common on trees and bushes, *AAA* (51); Lewisham, 2.viii.1892, *AJC* (HD); *WW* (4) (22); Lee, *WW* (4) (22) Kidbrooke Lane, 25.vii.1896, on elm hedges, *WW* (60) (SL); Darenth Wood, *AMM* (22); Bromley, viii.1887, *ES* (HD); Fawkham, 22.ix.53 & 12.ix.54, *GGES* (HD); Eynsford, 15.viii.37, *FJC* (SL); Shoreham, 1.ix.61, *KCS* (14); Westerham, 6.x.63, *KCS* (14); and on the boundary at Sevenoaks (Knole Park), 12.viii.66, on oak, *AAA* (51); and Gravesend, 16.viii.51, on lime, *TRES* (13).

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* Department of Botany, British Museum (Natural History), Cromwell Road, London SW7 5BD.

Surrey. Camberwell (Ruskin Park), 2.viii.51, 4. & 5.viii.51 and 12.viii.51, *SW* (44); Tooting Bec, 10.vii.24, IV instar larva, *EAB* (BM); Tooting Common, 30.vii.24, teneral adult, *HStJKD* (HD); Wandsworth, ix.1877, *ES* (HD); Kew Gardens, 29.vii.60 & 6.viii.60, larvae and adults on *Quercus* spp. near Cactus House and Temperate House, *L. Watson* & *HKAS* (7/**1961**, 180); Wimbledon Common, 6.viii.41, *FJC* (SL) (62); Surbiton, viii.1892, *ES* (HD); Coombe Wood, 13.ix.1882, on oak, *EAN* (C); Merton Park, 12.viii.48, 3.viii.49 & ix.51 (on broom), *FJC* (SL) (62); Beddington Sewage Farm, 11.viii.55, *EWG* (24); Addington, 19.viii.56, *SW* (44); Shirley Common, 26.vii.1875, *WW* (SL) (60) (62), Banstead Downs, n.d., *AAA* (51); Chipstead, 19.viii.06♀ & 12.ix.09♂, *ECB* (NM); Caterham, 21.ix.68, by beating shrubs on the scarp of the N. Downs, *KCS* (14); Gatton Park, 5.viii.17 ♂ *ECB* (NM); Reigate, 1949–53, in shrubbery and at light, viii & ix, *GBR* (45) & *GBR* per *FJC* (62); Headley Lane, 20.ix.20, *WJA* (SL); *WW* in *FJC* (62); Box Hill, 13.viii.05 ♀ & 2.ix.28 ♀, *ECB* (NM); 23.vii.32 & 21.vii.41, *FJC* (SL); n.d. *AAA* (51); Ranmore Common, *FJC* (62) [probably refers to the *Phytocoris reuteri* record of Coulson's from this locality—EWG.]; Epsom Common, 6.ix.53, *EWG* (24); Ashtead, 15.viii.46 & 11.vii.47, *FJC* (SL) (62); Bookham Common, 20.viii.1894, beating beech *WW* (60) (62); vii., *DL* (34); 16.viii.55, adult & V instar larvae, *EWG* (24); 9.x.55, *EWG* (24); 2.viii.60 (on oak) & 14.viii.60, *DL* (HD); 20.vii.69, 31.vii.69, 5.viii.69, 11.viii.69, 9.viii.66 & 4.ix.65, *PSB* (16); Oxshott Heath, 28.viii.61, on sallow, *AAA* (51); West End Common, 20.viii.51, *FJC* (SL); and on the boundary at Egham, 19.ix.54, on oak, *GEW* (40); Effingham, 25.viii.68, *PSB* (16); and Byfleet, *FJC* (62); and beyond by the Basingstoke Canal between Pirbright Bridge and Frimley Green, 1954–55, *HDS* (50); Abinger, viii.1900, *EAB* (BM); Clandon, viii.1900, *ES* (HD); Albury, 21.viii.41, *ECB* (NM); Guildford, 21.viii.41 ♀, *ECB* (NM); and Chilworth (Blackheath), *FJC* (62).

Bucks. Langley Park, 18.vii.53, on oak, *GEW* (40); and on the boundary at Chalfont St Peter, 15.vii.25, *EAB* (BM); and beyond at Amersham, 27.vii.52 (on maple), 22.viii.52, 25.viii.51 (on fir), 33.viii.55 (to light), 2.ix.51 and 4.ix.50, all records of *WJLeQ* (21); Chesham, 7.viii.59 (on elm), 25.viii.51 (on alder) and 5.ix.64 (on apple), all records of *WJLeQ* (21); Penn Wood, 26.viii.56, *WJLeQ* (21); and at Slough (ICBFS), 21.vii.33, 26.vii.33, 30.vii.33 & 12.ix.33, on oak, *WHG* (41); (PILG), 26.vii.55, on apple, *GEW* (EMM, **92**, 35).

Phytocoris populi (Linn.) Sp. 396 p. 296

S p. 235 B p. 381 (Sp. 270)

Local. Like the previous species, *Phytocoris populi* is found on a wide variety of deciduous trees, though oak, lime, alder and aspen are especially favoured, while in gardens apple and pear are most often chosen. When at rest on the bark the adults are difficult to detect owing to their cryptic colouration. They become fully mature by the end of July and may be found until the beginning of October. Both adults and larvae are predacious on psyllids and bark lice. A variety *distinctus*, with elytra entirely black, is recognised by some authors and is given below where such records have been positively identified.

Middx. Primrose Hill, vii.12, on *Populus niger* in garden of house in Oppidans Rd NW3, *EAN* (C); garden, N. London, vi.1884, on trunk of apple tree, *EAB* (BM); St John's Wood (Finchley Road) NW8, 31.vii.58, on *Tilia DL* (SL); 29.vi.60 & 16.vii.52, *DL* (54); Edgware (Scratch Wood), 23.vii.60, *DL* (54); Highgate, 15.vi.1893, beaten from trees in Gravel Pit Wood, *EAN* (C); and var. *distinctus* in garden, N. London, vi.1884, *EAB* (BM).

Herts. Chorley Wood, *EAB* (11) (12); Berkhamsted, vii.36, *DCT* (12); and just over the boundary at Harpenden, 8.viii.37, *DCT* (12); and beyond at Wymondley, viii.1880, *EAB* (BM). The var. *distinctus* has been taken at Cheshunt, 14.ix.12, *EAB* (BM).

Essex. Theydon Bois, vii.22, *EAB* (BM); Epping Forest, 14.ix.19, *ECB* (NM); and the var. *distinctus* from Chingford, vii., *CN* (35a); Epping Forest (Monk Wood) 3.ix.09, *CN* (35a); and (Loughton), 3.ix.09, *EAB* (BM).

Kent. Blackheath, 22.vii.1895, *AJC* (HD); *D & S* (4); 5.ix.1897, on fence *WW* (60) (39); (garden at 63 Blackheath Park), 8.viii.69 on bramble, and 11.viii.69 at light, *AAA* (51); Shooters Hill, 29.vii.61 ♀, by beating in woods fringing Eltham Common, *AAA* (51); Lewisham (Hither Green Lane), 2.ix.1899, on white poplar *Populus alba*, *WW* (60); Kidbrooke, 27.viii.1898, on fence, *WW* (60); Catford, 27.vii.1892, *AJC* (HD); and var. *distinctus* at Blackheath on poplars, *ES* (36).

Surrey. Honor Oak, vii.1893, *EAN* (C); Sheen Common, 16.vi.65, at the northern end, *PSB* (16); Coombe, *JAP* (BM); Streatham, 28.viii.67, *PSB* (16); Shirley, *WW* per *FJC* (62); Chipstead, 14.viii.10, *ECB* (NM); Box Hill, viii.54, on birch, *GEW* (14); Ashtead, 25.ix.48, *FJC* (SL) (62); Oxshott, 13.ix.19, *ECB* (NM); and beyond the boundary at Woking, ix.05, on poplars, *ES* (HD); Clandon, viii.1900, *ES* (HD); Guildford, 22. & 27.vii.43 ♂♂, *ECB* (NM); and Albury, 3.viii.44, *ECB* (NM); and the var. *distinctus* from Worcester Park, 21.vii.09, *ECB* (NM).

Bucks. Langley Park, 18.vii.53, on oak, *GEW* (40); and just over the boundary at Amersham, 22.viii.53, on lime, *WJLeQ* (21).

Phytocoris dimidiatus (Kb.) Sp. 397 p. 297
D & S p. 305 (*P. dubius*) S p. 237
B p. 385 (Sp. 273)

Local. Another species with a wide variety of deciduous tree hosts, chiefly oak, ash, apple and hawthorn. Also overwinters in the egg stage hatching in May or early June. The dark coloured adults are found from mid-June until November.

Middx. Buckingham Palace grounds, 1961, on buckthorn, hawthorn, poplar and willow, and taken also at light (September) "it is perhaps noteworthy that this dark species, normally less abundant than *P. tiliae*, was here the more numerous", *TRES* (52); garden in N. London, vi.1884, on apple trunk, *EAB* (BM); St John's Wood (Finchley Road) NW8, 20. & 30.vi.60, 16 & 18.vii.60, and 19. & 30.vii.60, all on *Tilia* *DL* (HD) (54) (EMM **97,** 69); Hampstead Heath, 30.vi.69 & 14.vii.49, *DL* (54); Highgate Wood, 3.vii.1886 & 3.vii.1890, *EAN* (C); Finchley, 6.viii.44 & 21.viii.49, *CHA* (17); Palmer's Green, 9.vii.19, adult and V & II instar larvae, *EAB* (BM); Ruislip LNR, 9.viii.64, a single adult taken on ash, *RAPM* (49); Uxbridge, 4.vi.33, 17.vii.33, 27.vii.35 & 12.ix.35, on *Quercus* and *Crataegus*, *DCT* (33a). [D. Leston (in litt.) informs me that he re-examined Woodroffe's Hounslow Heath specimen and found it to be *P. reuteri* and not *P. dimidiatus* as given in source 33b. It is therefore recorded under *P. reuteri* in this present paper.—E.W.G.]

Herts. Whetstone, 21. & 29.vi.60 ♂♂, 22. & 24.vi.60, 28. & 29.vi.60 ♂♂ & ♀♀, and 1.ix.60 ♂, all taken in M.V. light trap, *PHW* (pers. comm.) & (47); Barnet, viii.1885, *EAB* (BM); Barnet (Hadley Wood), 25.vi.44, *CHA* (17); Boreham Wood, 27.vi.60 & 18.ix.60, on *Crataegus* *DL* (54) (HD); Rickmansworth, 17.viii.34, on *Quercus* and *Crataegus*, *DCT* (12); and just over the boundary at Harpenden (Rothamsted Expt. Station grounds), 26.ix.33, to light, *DCT* (12); 1933–36, 5 ♂♂ in light trap, *DCT* (12).

Essex. Chingford, 22.vi.11, vii.1893, vii.07, & 18.ix.15, *EAB* (BM); *CN* (35a); Epping Forest, 22.ix.17, *EAB* (BM); 20.vi.64, *PLJR* (MM); Theydon Bois, vii.22, *EAB* (BM); *CN* (35a).

Kent. Blackheath, *D&S* (22); 5.vii.59, quite common on willow trunks, *AAA* (51); (garden at 63 Blackheath Park), easily the commonest of the genus to M.V. light with a long period (vi.–xi.) appearing first about mid-June (e.g. 15.vi.66) 'doubtless coming mostly from willow which are some little distance away', *AAA* (51); (garden at 63 Blackheath Park), only casually in garden itself e.g. 10.viii.64 (on ash) and 13.vii.59 & 27.viii.65 (on black poplar); Abbey Wood, *WW* (22); Hither Green, *WW* (4) (39) (22); Lee, 1899, *WW* (4) (39) (22); Darenth Wood, vi, on a plum tree, *D&S* (28) (4) (22); Bromley, on oaks, *ES* (37); Shoreham, 1.ix.61, *KCS* (14) (22); Westerham, 7.vii.22, *PH* (BM); and on the boundary at Sevenoaks (Knole Park), 4.vii.65, *SL* (1/**1965,** 59).

Surrey. Wimbledon Common, *FJC* (62); Cheam (Nonsuch Park), 13.viii.54, *EWG* (24); Carshalton Beeches, viii.58, at M.V. light *DC* per *AAA* (51); Addington, 6.x.62, *SL* (1/**1962,** 104); 19.viii.56, *SW* (43); Shirley, 1893, on oak, and 1895, *WW* (60) (62); Coulsdon, 14.viii.23, *ECB* (NM); Reigate, on oaks, *ES* (37); vii, 1969–53 by sweeping *GBR* (45); Box Hill, 7.vii.37, *ECB* (NM); and on the boundary at Englefield Green, 10.vii.54, on ash, *GEW* (40); and beyond at Horsell Common, 7.viii.33, *ECB* (NM); Woking, ix.1880, *ES* (HD); 21.vi.1892, at light (11 p.m.), *ES* (HD); Shere, viii.1900, *EAB* (BM); and Albury, viii.1900, *EAB* (BM).

BUCKS. On the boundary at Datchet (Ditton Park), 7.vii.62, on poplar, *GEW* (40); and beyond at Amersham, 12.viii.55, to light, and 1.ix.51, on elder, *WJLeQ* (21); Hodgemoor Wood, 28.vi.56, *WJLeQ* (21); Slough (PILG), 1.vii.60, *GEW* (40); and Burnham Beeches, 22.vi.12, *EAB* (BM).

Phytocoris longipennis Flor Sp. 398 p. 297

D & S p. 307 (*P. dimidiatus* D. & S. nec Kb.)

S p. 236 B p. 384 (Sp. 272)

Rare. Also arboreal in habit particularly on trunks and branches of oak, hawthorn, hazel and apple. Andrewes (17) has taken it on hornbeam *Carpinus betulus*. The pale green larvae hatch in spring from overwintered eggs and do not become adult until middle of July. Late maturing adults have been recorded up to mid-October.

MIDDX. Hampstead, *JAP* (BM); Edgware (Scratch Wood), 23.vii.60, *DL* (HD) (54); Ruislip, 7.viii.44, on *Carpinus*, *CHA* (17).

HERTS. Barnet, viii.1885, *EAB* (BM); Chorley Wood, *EAB* (11) (12); and just over the boundary at Harpenden, 17.ix.36, *DCT* (12); 1933–36, taken in light trap in Rothamsted Expt. Station grounds, *DCT* (59).

ESSEX. Chingford, 3.ix.09, 7.ix.08, ix.07 & ix.12, *EAB* (BM); Epping Forest, generally distributed, *CN* (35a) [I doubt that this species is 'generally distributed' even in Epping Forest—E.W.G.]; Purfleet, *RML* (5); and beyond the boundary at Brundon, 20.viii.20, *B. S. Harwood* (BM).

KENT. Blackheath, viii. on palings, *D&S* (28) (4) (37); (garden at 63 Blackheath Park), 27.iii.59, 4.viii.59, 1.viii.69 & 20.viii.66, singly at light, *AAA* (51); 19.viii.65, a pair and 26.viii.59 ♀, both on flowers of golden rod *Solidago canadensis* in garden, *AAA* (51); (Shooters Hill), 29.vii.61, 22.viii.63 and 13.ix.60 off oak, hawthorn, etc., *AAA* (51); Abbey Wood, 30.vii.1898, on oak, *WW* (60) (4) (39) (22); West Wickham, 13.viii.1898, *WW* (60); and beyond the boundary at Gravesend, 22.viii.54, *GGES* (HD).

SURREY. Wimbledon, on hazel, *ES* (37); Wimbledon Common, *FJC* (62); Shirley, *WW* per *FJC* (62); Banstead (Park Downs), 28.vii.55, *GEW* (40); Coulsdon, 25.ix.06 ♀, *ECB* (NM); Caterham, *GCC* (37); Reigate, *ES* (37); 1949–53, on *Corylus*, *GBR* (45); Headley Lane, 2.viii.1897, on wych elm, *WW* (60) (62); Box Hill, 7.viii.37 ♀ & 29.viii.37 ♂, *ECB* (NM); *WW* per *FJC* (62); Ranmore, 1949–53, *GBR* (45); Bookham Common, 14.viii.60, *DL* (HD); 12.viii.56 adult and 16.viii.55 V instar larvae, by beating *Salix fragilis*, *Crataegus* and crab apple *Malus sylvestris*, *EWG* (24); *WW* per *FJC* (62); Oxshott, *TRB* (37); Oxshott Heath, 28.viii.61, a single specimen on sallow, *AAA* (51); and on the boundary at Egham, 19.ix.54, *GEW* (40); and Dorking, 1870, *JS* (BM); and beyond at Gomshall, viii.1892 and 19.ix.10, *EAB* (BM); and Guildford, 12.viii.41 ♂♂ & ♀♀, *ECB* (NM).

BUCKS. Just over the boundary at Hedgerley, 3.ix.55, *GEW* (40).

Phytocoris reuteri Saunders Sp. 399 p. 297

D & S p. 309 (*P. crassipes* D. & S. nec Flor)

S p. 236 B p. 386 (Sp. 274)

Frequent. Several different species of deciduous trees are the host of *Phytocoris reuteri*, more especially oak, elm, alder, hawthorn and apple. Like all of the preceding species of *Phytocoris* it is predatory on psyllids, bark lice, aphids and other small invertebrates found on the bark of the host trees. Adults occur from June to September.

Middx. St John's Wood (Finchley Rd) NW8, 19. & 24.vii.50, *DL* (HD) (54); Highgate, 22.vi.1893, in Gravel Pit Wood, *EAN* (54); Crouch End, ix.09, *EAB* (BM); Finchley, 28.vii.46, *CHA* (17); Palmer's Green, 20.ix.20, V instar larva, *EAB* (BM); Hendon, 4.ix.1900, beating hedges in a lane, *EAN* (C); Edgware, viii.07, *EAB* (BM); (Scratch Wood), 22.vii.60, V instar larvae beaten from ash, *DL* (EMM **97,** 69); Harefield, 13.ix.52, *WJLeQ* (21); Uxbridge 12.ix.35 on *Crataegus*, *DCT* (33a); and Hounslow Heath, 18.viii.52, a single specimen beaten from hawthorn in a swamp, *GEW* (33b but wrongly ascribed therein to *P. dimidiatus*).

Herts. Whetstone, 23.vii.60♂ taken in M.V. light trap, *PHW* (*pers. comm.*) & (47); Barnet, viii.1885, *EAB* (BM); Boreham Wood, 18.ix.60, on *Ulmus*, *DL* (54) (HD); Bushey, *JAP* (BM); Broxbourne, 18.ix.09, *EAB* (BM); Haresfoot, near Berkhamsted, 19.vii.59, *WJLeQ* (21); Berkhamsted, 28.ix.35 on *Populus nigra*, *DCT* (12); and just over the boundary at Harpenden, viii.34, on *Tilia*, *DCT* (12).

Essex. Hale End, ix.1891, *EAB* (BM); and at Chingford, 11.ix.11, ix.07, ix.1892 & 8.x.10, *EAB* (BM); *CN* (35a).

Kent. Blackheath, *JAP* (BM); *WW* (60) (4) (39) (22); (garden at 63 Blackheath Park) less common than *Phytocoris tiliae*, 19.viii.57, ♂ & ♀ on apple trunk, 24.vii.68 beaten from apple tree, 18.viii.62 on beech hedge, 4.x.62 ♀ on pear tree, 24.viii.65, 24.viii.64 & 22.ix.66 on ash, and 9.viii.59, 8.viii.59, 11.ix.59, 4.x.59 & 27.viii.65 at light, all records of *AAA* (51); Shooters Hill, 6.x.14, *WW* (60); Dartford Brent, viii., by sweeping and on apple trees, *D&S* (C) (28) (4) (37); Lewisham, 28.ix.1891, *AJC* (HD); *WW* (39) (22); Lewisham (Chapman's Gardens), 28.viii.1896, on willow, *WW* (60); Kidbrooke (Kidbrooke Lane), 25.vii.1896, on elm hedges, *WW* (60) (4) (39) (22); Plumstead (Wickham Lane), 15.viii.1896 on broom, *WW* (60); Plumstead, 3.viii.1896, *AJC* (HD); between Catford and Ladywell, 7.viii.1897, on whitethorn, *WW* (60) (SL); Darenth Wood, *AMM* (22); Eynsford, 15.viii.37, *FJC* (SL); and Sevenoaks (Knole Park), 4.vii.65, *SL* (1/**1965,** 59).

Surrey. Tooting Bec, 30.vii.24 *HStJKD* (HD); Wimbledon, 14.viii.1880, *ES* (HD) (3); Surbiton, viii.1892, *ES* (HD) (3); Merton Park, 12.vii.35, *FJC* (SL) (62); Ewell, 10.ix.20, *EAB* (BM); Reigate, *ES* (3) (37); Betchworth, 1.x.55, *DL* (SL); Headley Lane, *WW* per *FJC* (62); Box Hill, 31.viii.36, *EAB* (NM); 10.vii.40, 21.vii.41, 22.vii.40 & 30.viii.48, *FJC* (SL) (62); Ranmore Common, 15.ix.32, *FJC* (SL); Mickleham, *GCC* (3) (37); Ashtead, 10.vii.48, 19.vii.47, 15.viii.46 & 13.ix.48, *FJC* (SL) (62); Bookham Common, 28.ix.31, *FJC* (SL); 27.viii.1896, *WW* (60) (62); 31.vii.69, *PSB* (16); 9.ix.51, *WJLeQ* (21); ix., x., *DL* (34); Esher Common, 17.ix.51, *FJC* (SL); West End Common, 20.viii.51, *FJC* (SL); and on the boundary at Egham, 6.viii.55, *GEW* (40); Effingham, 14.ix.44 & 28.ix.37, *FJC* (SL) (62); near Effingham, 25.viii.68, *PSB* (16); and beyond at Chobham, 1874, *ES* (HD) (3) (37); 19.ix.1891, *AJC* (HD); Horsell Common, 7.viii.33, *ECB* (NM); *JAP* (BM); Abinger, viii.1900, *EAB* (BM); Gomshall, 9.viii.36, *FJC* (SL); *EAB* (3); Shere, EAB (3); and Holmbury, *EAB* (3).

Bucks. On the boundary at Chalfont St Peter, 14.vii.25, II instar larva, *EAB* (BM); and just over the boundary at Chesham, 25.ix.60, on aspen, *WJLeQ* (21); Amersham, 11.viii.56, 22.viii.53, 30.viii.52, 2.ix.51 & 14.ix.52 (on ash), *WJLeQ* (21); Slough (ICBFS), 11.viii.31 ♀ on currant, *WHG* (41); (PILG) 26.vii.55, on apple, *GEW* (40) (EMM **97,** 69); and beyond that at Penn Wood, 26.viii.56, on oak, *WJLeQ* (21); Little Missenden, 13.vii.52, *WJLeQ* (21); Coombe Hill, 22.ix.51, *WJLeQ* (21); and Chiltern Hills, viii.15, *EAB* (BM).

Phytocoris ulmi (Linn.) Sp. 401 p. 298

D & S p. 311 (*P. divergens*) S p. 237

B p. 388 (Sp. 277)

Common and widely distributed. Found on small deciduous trees especially hedgerow oak, hazel, hawthorn and blackthorn. This species is partly predatory and partly phytophagous. Eggs hatch at intervals from the beginning of May and the larvae feed on small insects and the unripe fruits, buds and young leaves of various plants, nettle being often favoured. The imagines occur from June to October.

Middx. Finchley, 27.vi.43 & viii.47 on *Prunus* and *Urtica*, *CHA* (17); Palmer's Green, 9.vii.19, V instar larva, *EAB* (BM); Edgware (Scratch Wood), 22.vii.60 (on ash), 23.vii.60 & 26.vii.60 (on broom), *DL* (HD) (54); Ruislip LNR, 24.vii.56 ♂♂ & ♀♀, 29.vii.55 ♀, and 29.vii.58 ♂♂ & ♀♀, on hawthorn, *EWG* (49); 23.viii.64, a single adult found on the only broom bush on the reserve, *RAPM* (49); Harefield, 19.vii.60, on *Ulmus*, *DL* (HD) (54); Hounslow Heath, 1953, common on *Crataegus* on the heath area and in the swamp, *GEW* (33c).

Herts. Barnet, viii.1885, *EAB* (BM); Radlett, 28.vi.60, V instar larvae on *Crataegus*, *DL* (54) (EMM **97**, 69); and on the boundary at Harpenden, 1933–36, taken in light trap in Rothamsted Expt. Station grounds, *DCT* (59); and beyond at Wymondley, viii.1880, *EAB* (BM).

Essex. Woodford, 22.viii.25, *EAB* (BM); Chingford, vii.1893 (adult), 22.vi.11 (V instar larva), 25.vi.12 & 15.vi.12 (IV instar larvae), *EAB* (BM) (38); *CN* (35a); Buckhurst Hill, 20.viii.25, *EAB* (BM); Epping Forest (Loughton), 14.viii.25, *EAB* (BM); and Roydon, *JAP* (BM).

Kent. Blackheath (garden at 63 Blackheath Park), not common and only once found at light (4.viii.61), singly from trees and shrub, nearly all ♀♀; 24.vii.58 from *Pyrus* sp. 26.vii.58 under fruit trees, 4.ix.57 on hawthorn hedge, 28.vi.59 ♂ on pear, 13.vii.59 on beech hedge, 30.vii.69 & 10.viii.68 on bramble, all records of *AAA* (51) (22); Abbey Wood, 30.vii.1898, on elm, *WW* (60) (39); Belvedere, 25.vi.39, larva *RWA* in *SW* coll. (44); Lee, *JAP* (BM); *WW* (22); *WW* (4) (39); Lewisham, 20.vii.1891, *AJC* (HD); *WW* (4) (39) (22); Kidbrooke, 6.viii.1898, on elm, *WW* (60) (SL) (39); (Kidbrooke Lane), 18.vii.1896 on elm *WW* (60); Eltham, *JAP* (BM); Darenth Wood, 22.ix.1890, *DS* (C); amongst black currant bushes, *D&S* (28) (4) (22); 21.vii.01, *ECB* (NM); 8.vii.50, beating oak, *TRES* (13); West Wickham Wood, 21.vii.1894, on elm, *WW* (60) (SL); 7.vii.1894, *WW* (60); Otford chalkpit, 29.viii.57, a single specimen, *AAA* (51) (22); Shoreham 17.vii.60, *KCS* (14); and on the boundary at Sevenoaks (Knole Park), 4.vii.65, *SL* (1/**1965**, 59).

Surrey. Wimbledon Common, 22.vi.1897 & 7.vii.1897, *EAN* (C); Wimbledon, 3.viii.32, *FJC* (SL); Wimbledon Common, 3.viii.46, *FJC* (SL) (62); Shirley, *FPP* (HD); Chipstead, viii.10 & 23.vii.11, *ECB* (NM); Riddlesdown, 4.ix.54, *SW* (44); Reigate, 19.viii.16, n.c. [possibly *WJA*] (SL); vii. 1949–53, on various shrubs and *Ononis* & *Stachys*, *GBR* (45); (Oakfield), [prior to 1867], by beating, *J & TL* (32); Box Hill, viii.1892, *EAB* (BM); 11.viii.34, *ECB* (NM); vii.17, on elm, *n.c.* [possibly *WJA*] (SL); Claygate, *JAP* (BM); Ashtead, 10.vii.46 *FJC* (SL) (62); Leatherhead, *FJC* (62); Bookham Common, 15.vii.49, *FJC* (SL); *WW* per *FJC* (62); ix., *DL* (34); 31.vii.69, 5.viii.69 & 9.viii.66, *PSB* (16); Oxshott Heath 12.vii.52, *DL* (1/**1952–53**, 84); Esher, *FPP* (HD); West End Common, 13.viii.51 & 20.viii.51, *FJC* (SL); Arbrook Common, 30.vi.52 & 7.vii.53, *FJC* (SL); Ockham Common, 22.vii.49, *FJC* (SL); Weybridge, 3.viii.19, *HD* in *EAB* coll. (BM); and on the boundary near Effingham, 25.viii.68, *PSB* (16); and Byfleet, 28.vii.41, *FJC* (SL) (62); and beyond at Virginia Water, 22.viii.1894, beating in the lanes, *WW* (60); Woking, viii.1888, *ES* (HD); and Guildford, 9.vii.41 & 22.viii.41, *ECB* (NM).

Bucks. On the boundary at Chalfont St Peter, 15.vii.25, *EAB* (BM); Datchet (Ditton Park), 7.vii.62, *GEW* (40); and just beyond at Hedgerley, 6.vii.53, on hawthorn, *GEW* (40); Slough (ICBFS), 9.vi.33 and 11, 12, & 21.vii.33 on *Ribes nigrum*, *Abies* sp. and oak, *WHG* (41); (PILG) *GEW* (40); Burnham Beeches, 16.vii.55, on hawthorn, *WJLeQ* (21); and Coombe Hill, 1.ix.51, *WJLeQ* (21).

Phytocoris varipes Boh. Sp. 402 p. 298

D & S p. 313 (*P. ulmi* D. & S. nec Linn.)

S p. 238 B. p. 387 (Sp. 276)

Common and widely distributed. Occurs in rough grassland, hedgerows, heaths and commons, and also on salt-marshes. Both larvae and adults are mostly phytophagous feeding on the flowers and unripe fruits of various grasses (particularly *Phleum pratense* and *Bromus* spp.), yarrow, scentless mayweed, hardheads, clover, sorrel and creeping thistle, though occasionally small insects may be taken. The overwintering eggs laid on the host plants hatch in spring and the first larvae mature by mid-June though the adults are not widespread until July and August. Late examples are occasionally recorded up to the beginning of October.

MIDDX. Cripplegate bomb-sites, City of London, 23.vii.55, V instar larva, *EWG* (25) (24); Mill Hill, 15.viii.58, *DL* (HD); Edgware (Scratch Wood), 26.vii.60, *DL* (HD) (54); 12.viii.56 & 15.viii.58, *DL* (54); Ruislip, 7.viii.44, *CHA* (17); Ruislip LNR, 24.vii.56, 29.vii.55 & 19.ix.56, all ♀♀, *EWG* (24); Hounslow Heath, 26.vii.52, *GEW* per *DL* (54).

HERTS. Whetstone, 24–31.vii.60♂♂ and 4 & 22.viii.60♂♂, taken in M.V. light trap *PHW* (*pers. comm.*) & (47); Bushey, 5.viii.44, *CHA* (17); Chorley Wood, 16.viii.16, *EAB* (BM); Bricket Wood Common, 3.vii.56, V & IV instar larvae, *EWG* (24); and just over the boundary at Harpenden, 1.ix.54, *GGES* (HD).

ESSEX. Chingford, 18.ix.15, V instar larva, *EAB* (BM); and beyond the boundary at Canvey Island, 2.ix.51 & 16.ix.51, on sea wormwood *Artemisia maritima*, *SW* (44); Widford, viii.53, *JHF* (42); and Danbury Common, viii.53, *JHF* (42).

KENT. Blackheath, 30.viii.36, *FJC* (SL); (garden at 63 Blackheath Park), occurring singly, 31.viii.58 & 8.viii.64, the latter off yarrow; 4.viii.60, one specimen off mugwort *Artemisia vulgaris* in a lane, *AAA* (51) (22); Charlton, 9.ix.58, common on waste ground (now built on), *AAA* (51) (22); Abbey Wood marshes, 31.viii.55, by sweeping, *EWG* (24); Upper Belvedere, 18.viii.60, *RGR* (WBM); Bexley (Joyden's Wood), 10.ix.60, *KCS* (14); Darenth (chalkpit at South Darenth), 10.ix.60, in some numbers on *Centaurea scabiosa*, etc., *AAA* (51) (22); Eynsford, 15.viii.37, *FJC* (SL); Hayes Common, 29.viii.65, *PJC* (63); Downe (Darwin's Bank), 15.ix.62, *KCS* (14); (Cuckoo Wood), 15.ix.62, *KCS* (14); Otford Downs, rather local, *AAA* (51); Shoreham, 21.viii.66, *PJC* (63); 25.viii.64 & 1.ix.61, *KCS* (14) (22); Farningham, *KCS* (22); Kingsdown, 28.viii.24, *EAB* (BM); Westerham, 11.ix.67, on the Downs to the north of the town, *KCS* (14); and on the boundary at Gravesend, 13.viii.48, at light, *TRES* (13); and beyond at Halling, 30.viii.59, *MGM* (1/**1959,** 91).

SURREY. Mitcham Common, 23.viii.67, *AAA* (51); Addington, 6.x.62, *SL* (1/**1962,** 104); Shirley Common, 1.ix.1894, *WW* (60) (SL); Warlingham (Halliloo Valley), 2.viii.63, *KCS* (14) (48); 29.viii.64 (14); Banstead Downs (Carshalton end), various dates, *AAA* (51); Banstead, 5.vii.53, V instar larva, on rough ground (partly wooded) to the south of Yew Tree Bottom Road (now built on), *EWG* (24); Riddlesdown, 20.vi.53 (larva), 12.vii.58 (V instar larva), and 1.viii.53 adult♂♂ & ♀, by sweeping, *EWG* (24); 4.ix.54, *SW* (1/**1954–55,** 13); Caterham, 21.ix.68, by beating shrubs on the scarp below Pilgrim Fort, *KCS* (14); Reigate, vii. & viii., 1949–53, by sweeping, common, *GBR* (45); (Oakfield), [prior to 1867], by beating, *J&TL* (32); Tadworth, 3.viii.52, on grass stems on rough ground between Whitebeam Way and the bridlepath south from Walton Downs, *EWG* (24); Box Hill, 22.vi.1897, *WW* (60); 18.vii.37, 10.viii.35, 13.viii.05, 31.viii.36 & 5.ix.09, *ECB* (NM); 23.vii.42 & 15.ix.34, *FJC* (SL); 5.ix.53, on *Tanacetum*, *SW* (44); 1.viii.62 & 18.ix.57, *AAA* (51); 2.x.55, *EWG* (24); Ranmore Common, 27.viii.62, *PSB* (16); Epsom Common, 6.ix.53, *EWG* (24); Ashtead, 15.viii.46, 13.ix.48 & 14.ix.47, *FJC* (SL); Bookham Common, 19.vii.53 (adult & larva), 9 & 16.viii.53♂♂, ♀♀ & IV instar larva 27.viii.55, 13.ix.53 & 13.ix.56♀♀, 26.ix.55 ♀♀, and 4.x.53♂ & ♀, all records of *EWG* (24); 29.vii.50, *DL* (1/**1950–51,** 76); 19.vii.64, 31.vii.69, 11.viii.69 & 1.ix.69, *PSB* (16); vii. & viii., *DL* (34); Oxshott, 28.ix.1892, *AJC* (HD); vii & viii, 1949–53, by sweeping, common, *GBR* (45); Esher Common, 12.vii.52, *DL* (1/**1952–53,** 84); 28.viii.61, *AAA* (51); 4.viii.55, *EWG* (24); West End Common, 13.viii.51 & 28.viii.53, *FJC* (SL); Weybridge, *JAP* (BM); and on the boundary at Egham, 5.vii.57, *GEW* (40); near Effingham, 25.viii.68, *PSB* (16); and Byfleet, 8.ix.41, *FJC* (SL); and beyond at Horsell Common, 16.ix.31, *FJC* (SL); Woking, viii.1888, *ES* (HD); by the Basingstoke Canal between Pirbright Bridge and Frimley Green, 1954–55, *HDS* (50); Blackheath & Farley Heath, 30.viii.36, general sweeping, *FJC* (1/**1936–37:** 36); Albury Down, 19.ix.31, *FJC* (SL); and Ewhurst, ix.1890, *EAB* (BM).

BUCKS. On the boundary at Chalfont St Peter, 17 & 18.vii.25, IV instar larvae, *EAB* (BM); Datchet (Ditton Park), 16.ix.56, *GEW* (40); and beyond at Slough (Upton Court Road), 1953–54, on waste plot, plentiful, *GEW* (33d); Coleshill, 2 miles from Amersham 2.ix.50, *WJLeQ* (21); and South Heath, N. of Missenden, 15.x.50, *WJLeQ* (21).

Phytocoris insignis Reut. Sp. 403 p. 299

First recognised as a distinct species for Britain in 1957 (see Woodroffe, G. E. *Entomologist* **90:** 258–259) having formerly been confused with *Phytocorpis varipes*.

Very local. At present known only from the Chobham, Esher, Oxshott Commons and Ash Vale (localities on the Bagshot Sands) in Surrey and one locality in Bucks. The adults are found from early August to mid-September.

Surrey. Oxshott Heath, 28.viii.61, *AAA* (51); Esher Common, 4.viii.55 ♂, *EWG* (24); 27.vii.64, *AAA* (51); and beyond the boundary on Chobham Common, 21.viii.56, in heather, *GEW* (40); 19.vii.68, *AAA* (51).

Bucks. Just over the boundary at Chesham (Cowcroft Wood) 14.ix.63, *WJLeQ* (21).

Capsus ater (Linn.) Sp. 404 p. 299

D & S p. 440 (*Rhopalotomus ater*)

S p. 262 (*R. ater*)

B p. 444 (Sp. 317, *R. ater*)

Common and fairly widespread in the London Area. This species hibernates in the egg stage. The adults, which are found from July until mid-August, are associated with various species of grasses particularly rye-grass *Lolium perenne*, couch *Agropyron repens*, meadow foxtail *Alopecurus pratensis*, Yorkshire fog *Holcus lanatus* and meadow fescue *Festuca pratensis;* they feed on the lower parts of the stems. Two colour forms occur: one black with a reddish-brown pronotum and head, the other entirely black. These forms have been recognised by some authors as being of varietal status and assigned the names var. *semiflavus* and var. *tyrannus* respectively. As the majority of published records do not indicate the form referred to, it has not been practical to attempt any separation in the list of records given below.

Middx. Hampstead Heath, 1949, *DL* (1/**1949–50:** 36–38); Highgate, n.d., *EAN* (C); vii.1885, *EAB* (BM); vi.1893, ♀ *EAB* (BM); vi.1893 ♂ and vii.1885, *EAB* (BM); Finchley, 20.vi.43, in grass, *CHA* (17); Edgware (Scratch Wood), 5.viii.42, *HWJ* (43); Ruislip LNR, adults found from mid-June until the end of July (18.vi.57, 19.vi.58, 27.vi.55, 24.vii.56, 29.vii.55 & 29.vii.58) and V instar larvae in mid-June (19.vi.58), being a common species in *Deschampsia* grassland and on *Phalaris arundinacea*, all records of *EWG*; *RAPM* observed in 1964 that those on the *Deschampsia* were of the entirely black form while those on *Phalaris* were the form with the brown head and pronotum and black body (49); Pinner, vii.22, *OGH* (BM).

Herts. Barnet (Hadley Wood), 1943, *CHA* (17); Elstree, 22.vi.60, *DL* (HD) (54); Aldenham, 23.vii.61, *DL* (HD) (54); Radlett, 20.vi.60, adult, *DL* (HD); 20.vi.60 & 26.vi.60, V & IV instars, both parasitized, *DL* (54); Broxbourne, 1960, *BSN* (58); and just over the boundary at Harpenden, 1.vii.55, 5.vii.55, 7.vii.54, 12.vii.55 & 5.ix.54, *GGES* (HD); and beyond at Tring, 14.viii.33, *DCT* (12).

Essex. Epping Forest, 15.vi.57, *WJLeQ* (21); (Chingford) n.d., *CN* (35a); 8.vii.11 (adult) and 5.vi.15 (IV instar), *EAB* (BM); 22.vi.11 ♀, *EAB* (BM); Stanford le Hope, 21.vi.62, *KCS* (14); and beyond the boundary at Benfleet, n.d. (II instar) *EAB* (BM); and Canvey Island, 17.v.14 (I instar) *EAB* (BM).

Kent. Blackheath, 18.vi.60, 20.viii.60, 24.vi.64, 30.vi.66 and 29.vi.68, not common, always singly (except once) by sweeping grass, etc., *AAA* (51); Plumstead, *WW* (39); Abbey Wood, 9.vii.1898, *WW* (60); 16.vii.1898, *WW* (SL); Lewisham, *WW* (4) (39) (22); 8.vi.1892 & 2.vii.1893, *AJC* (HD); Lee, *WW* (4) (22); Kidbrooke, *WW* (4) (39) (22); 1893 and 23.vii.1898, *WW* (60); Darenth, 25.viii.1893, *AJC* (HD); Birch Wood, *JAP* (BM); Chislehurst, 30.vi.68, *KCS* (14); Beechen Wood, S. of Swanley, 4.vii.70, *KCS* (14); Otford, 3.vi.61, and 16.vii.64 (one nymph), *AAA* (51); and on the boundary at Gravesend, *JAP* (BM); and beyond at Wrotham, *KCS* (22); Trottiscliffe, *KCS* (22); and Higham Marshes, 14.vii.63, *KCS* (14); 28.vii.66, *AAA* (51).

Surrey. Kew Gardens, 2.vi.49, in the herbarium expt. ground, *R. D. Meikle* per *HKAS* (7/**1952:** 285); 11.vi.49, several on grass by tennis courts, *HKAS* (7/**1952:** 285); Putney, vii.1887, sweeping willow near the soap works, *EAN* (C); Wimbledon, 2.viii.1882, *EAN* (C); Wimbledon Common, 17.vi.1889, (*ECB* NM in *ECB* register);

Cheam (Nonsuch Park), 8.vii.55, *EWG* (24); Warlingham, 16.vii.63, garden in Court Farm Road, *EL* (48); Purley, 3.vi.44, *JLH* (60); Coulsdon, 20.vi.15, 27.vi.14, 8.vii.06 & 9.vii.11, *ECB* (NM); Old Coulsdon (Happy Valley) 4.vii.54, *EWG* (24) (EMM **90:** xxxix); Farthing Downs, 4.vii.54, *EWG* (24); rough slopes below Devilsden Wood, 4.vii.54, *EWG* (24); Chipstead, 29.vi.18, *ECB* (NM); Godstone, 22.vi.63, *KCS* (14); Oxted, 11.vi.1893, *AJC* (HD); Reigate (Redstone Hill), [prior to 1867], *J&TL* (32); *GBR* per *FJC* (62); Box Hill, 26.vi.39 ♂, 4.vii.40, 21.vii.41 & 22.vii.40 ♂, *FJC* (SL); 24.vi.51, *SL* (1/**1951–52:** xvi); *FJC* (62); Mickleham, 29.vi.11 & 1.vii.06, *ECB* (NM); 6.vi.1895, *WJA* (60); Ashtead Woods, 21.vi.47, *FJC* (SL) (1/**1947–48:** 64) (62); Ashtead, 15.vi.48, 24.vi.50 & 5.vii.41, *FJC* (SL); Leatherhead, *FJC* (62); Bookham Common, 3.v.56 (IV instar) and 8.vii.56 (adult ♂ and ♀♀); 29.vii.50, *SL* (1/**1950–51:** 76); *FJC* (62); vii. & viii., *DL* (34); 8.vii.56, *DGH* (57); 19.vii.64, 20.vii.69, 5.viii.69 & 11.viii.69, *PSB* (16); 7.vii.41 ♀, 30.vi.41 ♂, & 6.vii.35, *FJC* (SL); Oxshott, vii.16, *WJA* (60); 16.vii.1899 (NM in *ECB* register); Esher, *JAP* (BM); Esher Common, 27.vii.64, *AAA* (51); West End Common, 9.vii.51, *FJC* (SL); Arbrook Common, *FJC* (62); 16. & 26.vi.52 and 7.vii.53 ♂, *FJC* (SL); Weybridge, 30.vi.63, *PSB* (16); and on the boundary at Egham, viii.54, *GEW* (40); East Horsley, 7.vii.1900, *SL* (1/**1900:** 16); Byfleet, 19.vi.15, *EAB* (BM); *FJC* (62); and beyond at Shere, 7.vi.1889, by sweeping roadside, *EAN* coll. (C); Guildford, 22.vii.43, *ECB* (NM); Horsell, *JAP* (BM); Woking, vi.1892, *ES* (HD); Albury, 7.vii.39, *FJC* (SL) (62); Chiddingfold, 1893, *HStJKD;* and Milford, 13.vii.63, *PSB* (16).

BUCKS. On the boundary at Chalfont St Peter, 15.vii.25, *EAB* (BM); Datchet (Ditton Park), 15.viii.56, *GEW* (40); and just over the boundary at Slough (ICBFS), 7., 11. & 15.vi.34 and 21, & 22.vi.33, on *Urtica dioica* and on grass, *WHG* (41); Amersham, 16.vii.64, 18.vii.54 & 22.vii.56, *WJLeQ* (21); and beyond at Burnham Beeches, 22.vi.19, *EAB* (BM); Ivinghoe, 23.vi.57, *WJLeQ* (21); and Great Missenden, 23.vi.45, *R. V. Aldrich* (60).

Pantilius tunicatus (Fab.) Sp. 406 p. 300

D & S p. 333 S p. 230 B p. 379 (Sp. 268)

Local. Found on birch, alder and hazel on which both the adults and larvae feed on the young male catkins, buds and shoots. The overwintered eggs do not hatch until late summer and the larvae, found during August and September, quickly feed up and become adult. Few fully grown examples have been found later than the second week in October. Three records have come to notice (see below) of the larvae having been taken on other than the usual host trees; one was on a wych elm *Ulmus glabra*, another on alder *Alnus glutinosa* and the third on maple *Acer campestre*. Essex records required.

MIDDX. Buckingham Palace grounds, 1961, adults on birch and five larvae also taken on wych elm (not previously recorded on this host), *TRES* (52); Hampstead, 1884–1888, *FAW* (23); Ruislip LNR, 23.viii.64, adult ♂ with pronounced red pigmentation, *RAPM* (49); 1.ix.55, IV instar, beaten from birch, *EWG* (49) (24); Uxbridge, 12.ix.35, on *Betula*, *DCT* (33a); 27.viii.35, nymphs on *Alnus glutinosa*, *DCT* (33a).

HERTS. Chorley Wood, *EAB* (11) (12); Bricket Wood, 17.ix.60 ♂, ♀♀ and V instar larva, *DL* (54) (EMM **97:** 69); Cheshunt, 13.ix.15 (V instar), 8.ix.11 (IV instar), and 13.ix.15 (III instar), *EAB* (BM); Berkhamsted, viii.33, nymph on *Corylus*, *DCT* (12); and just over the boundary at Harpenden (Rothamsted Expt. Station grounds), 10.x.34 ♂, taken in light trap, *DCT* (59) (12); and beyond at Tring, ix.1899, on *Corylus*, *FBJ* (12); and Gt Offley, 1921, *RP* (11) (12).

KENT. Blackheath, 8.ix.59 ♂ at light, *AAA* (51) (22); (Shooters Hill) 13.ix.60, one adult and nymphs on hazels of woods fringing Eltham Common, *AAA* (51); Shooters Hill, *WW* (39) (22); Abbey Wood, *WW* (4) (22); Lewisham, n.d., ♀♀ & ♂♂, *WW* (60); Darenth Wood, 22.ix.1890, *DS* (C) (28) (4) (22); Bromley, n.d., on hazel, *ES* (4) (37) (22); (Hayes Common), viii.1886, *ES* (HD); and beyond at Ryarsh, 26.ix.34, *AMM* (BM in *AMM* coll.); and Higham, 1.x.61, *PLJR* (MM).

SURREY. Wimbledon Common, n.d., on hazel, *ES* (3) (37) (62); 12.x.39, *FJC* (SL) (62); 8.x.51, on tree trunk, *TRES* (13); 4.ix.49, in garden at Merton Park SW20, *FJC* (SL); Worms Heath, 13.ix.50, *R. W. Crosskey* (BM); Riddlesdown, 28.ix.57, *SW* (43) (1/**1957:** 79); Reigate, n.d., on hazel, *ES* (3) (37) (42); Redhill, [prior to 1867]

J&TL (32); Buckland Hill, 17.x.39, *ECB* (NM); Headley Lane, *WW* (62); Headley Heath, 30.ix.55, *SW* (44); Box Hill, 24.ix.1892, *ES* (HD); n.d., beaten from juniper bushes, *WW* (1/**1897**: 147) (62); 1.x.55, *DL* (SL) (60); 2.x.55, *EWG* (24); 24.ix.59 ♀, from hazel, *AAA* (51); Ranmore Common, 2.x.55, *SW* (44); Mickleham, 21.vi.1890, *TRB* (1/**1890–91**: 36) (37) (3) (62); n.d., *D&S* (28); 16.ix.1893, *ES* (HD); 17.ix.05, *ECB* (NM); n.d., *JAP* (BM); ix.13, *WJA* (60); Ashtead Common, 28.ix.46, on hazel, *FJC* (1/**1946–47**: 77) (SL) (62); Oxshott Heath, 13.ix.19, *ECB* (NM); x.15, *L. J. Tremayne* (2/**1916**: 12); ix.08, ix.15 & x.16, *WJA* (60); Esher Common, 25.ix.51, *FJC* (SL); n.d., *GCC* (3) (62); on alder *Alnus glutinosa*, *TAM* (37). On the boundary at Effingham 28.ix.37, *FJC* (SL) (62); and Byfleet, 12.ix.36 & 28.ix.41, *FJC* (SL) (62); and beyond at Ash Vale, 4.ix.49, *DL* (1/**1949–50**: 78) (HD); 10.ix.50, on birch but confined to very few individual trees with nymphs of the last two instars also present, *DL* (1/**1950–51**: 80) (HD); Basingstoke Canal between Pirbright Bridge and Frimley Green, 1954–55, *HDS* (50); Shere, 1887 on hazel, *EC* in *EAN* coll. (C) (3); and St Martha's Hill, *EAB* (3).

BUCKS. On the boundary at Little Chalfont, ix.59, *WJLeQ* (21); and just over the boundary at Amersham, 20.x.51, on maple *Acer campestre*, *WJLeQ* (21); Slough (PILG), ix.53, *GEW* (40); and beyond that at Coombe Hill, 6.ix.52, *WJLeQ* (21).

Capsodes flavomarginatus (Don) Sp. 407 p. 301

D&S p. 476 (*Lopus miles*) S p. 232 (*L. flavomarginatus*)

B p. 376 (Sp. 266, *L. flavomarginatus*)

Rare. Although the adults, occurring from June until early August are said to be chiefly associated with the common cowwheat *Melampyrum pratense*, they have been found on the flowers of various other species including yellow toadflax *Linaria vulgaris*, wild rose *Rosa* spp., wood spurge *Euphorbia amygdaloides* and bramble *Rubus* spp. No records are at present available for Middlesex and those parts of the counties of Herts., Surrey and Bucks. which lie in the Society's Area.

ESSEX. Epping Forest (Chingford), vii.07, 10.vi.11 & 14.vi.13, *EAB* (BM); 5.v.15, two V instar larvae one of which later moulted to a ♂ imago, *EAB* (38) (BM); (Fairmead), n.d., by sweeping, *CN* (35a).

KENT. Plumstead, n.d., *WW* in *EAB* coll. (BM) (38) (22); Abbey Wood, 2 & 16.vii.1898, on brambles, *WW* (60) (4) (39) (38) (22); vii.1895, *WW* in *EAB* coll. (BM).

Capsodes gothicus (Linn.) Sp. 409 p. 302

D & S p. 475 (*Lopus gothicus*)

S p. 231 (*L. gothicus*) B p. 374 (Sp. 265, *L. gothicus*)

Local. The adults are found on the large clumps of the greater birdsfoot trefoil *Lotus uliginosus* growing on damp grassland and in marshy situations where they occur from the end of June until early August. There are no records available at present for Middx., Herts. or Bucks., so likely habitats in these counties should be searched for this species.

ESSEX. Epping Forest (Chingford), 3.vii.09, *EAB* (BM).

KENT. Birch wood near Darenth, *TAM* (4) (37) (22).

SURREY. Coombe, vi, *JAP* (3); Wimbledon Common, vii.1880, *ES* (HD); Reigate, n.d., *ES* (3) (37); Reigate Heath, [prior to 1867], in sand-pit, *J&TL* (32); Box Hill, 31.v.19, larvae in three instars, V, IV & III, *EAB* (BM) (38); Bookham Common, 3.viii.58, *DL* (SL); 30.vii.51 *DL* (HD); 1.vii.49, *FJC* (SL) (62); vii., *DL* (34); 8.vii.51, *DGH* (57); 14.vi.53, V instars and 19.vii.53 adult ♂, *EWG* (24); 12.viii.56, adult ♀ nectar sipping on flowerhead of devilsbit scabious *Succisa pratensis*, *EWG* (24); 4.vii.54, *TRES* in *WJLeQ* coll. (21) (Entom. **90**: 301–303, 1957); 4.vii.54, adult ♂♂ & ♀♀ including a ♂ & ♀ of the var. *supercilliosus* D.&S., *AMM* (BM); 31.vii.69 & 5.viii.69, *PSB* (16); and beyond the boundary at Woking, vii.1888, *ES* (HD) (3) (37); Chobham, 11.vii.1895, *AJC* (HD); Shere, 27.ix.1888, *EC* in *EAN* coll. (C) (3); Clandon, 22.vi.1897, *AJC* (HD); and Merrow Downs, *EAB* (3).

(End of Part X)

The Decline of the Common Frog in the London Area

by John A. Burton*

For many years it has been widely accepted that the common frog *Rana temporaria* L. has been declining in many parts of England, and indeed various authors have produced evidence (Cooke 1972, Beebe 1973), though usually only for limited areas (Simms 1969, Perring 1966).

The main reason for the lack of precise information is that it is only in comparatively recent times that records have been kept and distribution maps plotted for many animal species. A comparison of modern distributions (Arnold 1973) with those made ten or twenty years ago (Taylor 1948, 1963) will often show increases for all but the rarest and most local species. This is almost entirely due to increased activity on the part of the observers, the factor which often also accounts for the actual distribution patterns recorded. Burton (1966) and Yalden (1967) produced maps for a wide variety of species of mammals and amphibians in the London Area, most of which showed a marked bias towards the south and in particular the south-west, with virtually no records from the eastern parts of the London Area. The reason is that the records for these maps were largely gathered from a small band of very active field workers, with only a small percentage of records from casual observers elsewhere.

In order to overcome some of these biases and collect some information about apparent changes in the population of the common frog, in 1973 a simple questionnaire was sent to members of both the London Natural History Society and Friends of the Earth residing in the London Area. The questionnaire was designed to be mainly answered in a 'Yes' or 'No' manner, with extra space for any further information. It is therefore apparent that the results obtained from this survey are subjective. Altogether 79 questionnaires were returned.

Table 1. Apparent causes of decline in common frog in the London Area, based on 79 replies to questionnaire.

Destruction of ponds	31
Pollution of ponds	25
Collecting by children	22
Collecting for or by schools	15
Killing by cats	5
Road casualties	3
Other causes	8

The results of the question which asked the informant to nominate the cause of decline have been tabulated in Table 1. Only three people were able to produce evidence of a slight increase and twelve observations were inconclusive. It must be borne in mind that more than one answer could, and often was, given. But it is probable that the very fact that decreases had been noted prompted the sending in of the questionnaire in many cases. More significant are the reasons to which most people attributed the decline: after pollution and destruction of the breeding ponds, collecting by children and schools were generally thought to be serious threats, suggesting that protective legislation might be desirable. Only five people thought cats played a significant part in the decline, and among the 'other' causes three people attributed declines to predation by waterfowl. No one mentioned birds of prey, though frogs are taken in significant numbers in suburban areas, particularly by tawny owls (G. Beven in litt.), which has probably increased in central London, where the common frog is now almost extinct.

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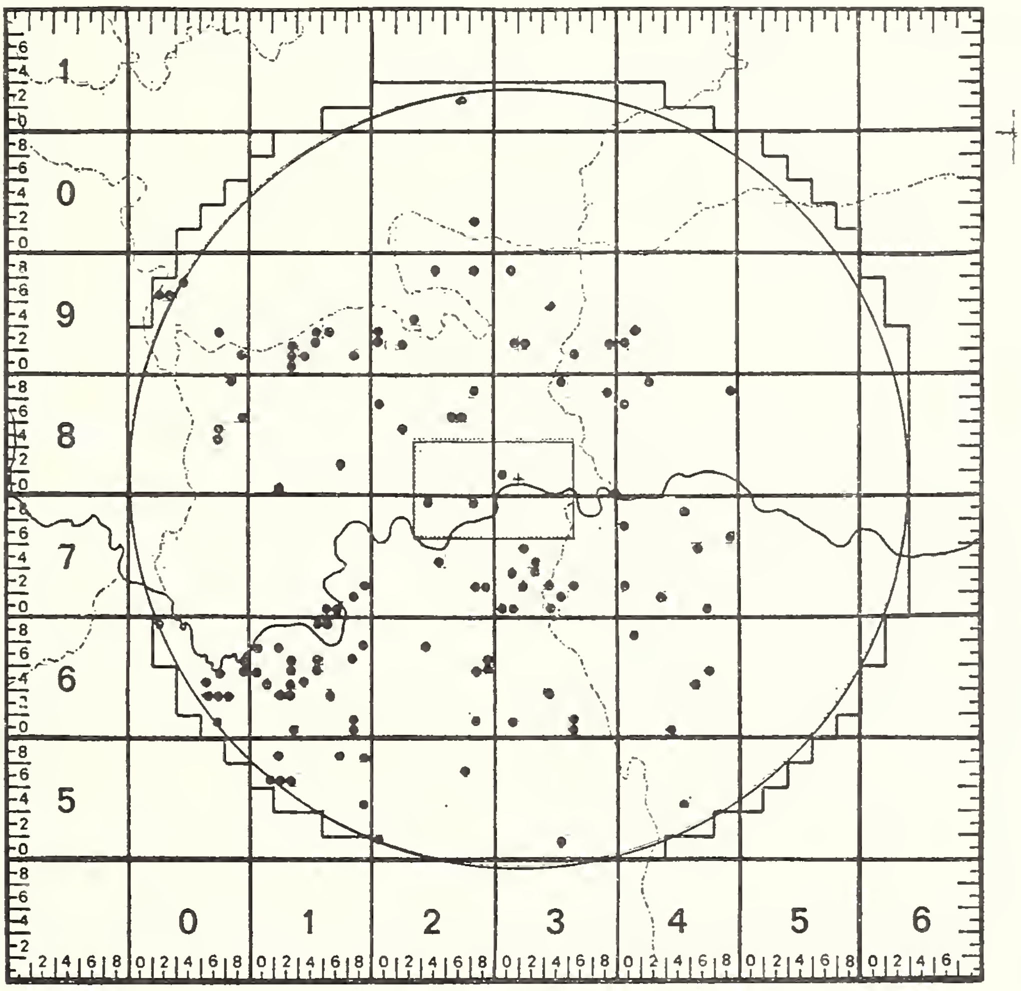
TABLE 2. The number of 1-kilometre grid squares from which the common frog has been recorded in the London Area.

COUNTY	YALDEN 1967		BURTON	
		%		%
HERTS	1	1·5	7	9
ESSEX	1	1·5	10	13
MIDDLESEX	12	17	27	36
SURREY	47	67	24	32
KENT	9	13	8	10
TOTAL	70	100	76	100

One of the interesting results of this enquiry was that the records sent in covered a much wider area than those collected by Yalden (1967). This suggests that the gathering of records by special questionnaires is more efficient than the general recording practised by most natural history societies. Table 2 shows the distribution by vice-county of the number of 1-kilometre grid squares recorded by Yalden from 1959–1966, compared with the present survey.

The map (Fig. 1) shows the approximate position of the records submitted during the enquiry, together with Yalden's results. In some cases an accurate plot was not possible, but the error should not be greater than 1 km; any localities which could not be plotted to this degree of accuracy were omitted.

FIG 1. Map of the London Area (showing the 10km grid, River Thames and vice-county boundaries) with all common frog (*Rana temporaria*) records from Yalden (1967) and the present survey, plotted by 1 km squares.



Firstly I must thank all the members of the London Natural History Society, Friends of the Earth, and others, who completed the questionnaire upon which this paper is based. For help in the production and circulation of the questionnaire I would like to thank Mrs A. Warren, A. M. Hutson and Angela King. For reading the MS and making several suggestions I thank Dr E. N. Arnold.

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Book Review

An Illustrated Guide to Aquatic and Water-borne Hyphomycetes (Fungi Imperfecti) with Notes on their Biology. By C. T. Ingold. 96 pages, 39 text figs. Freshwater Biological Association, Ambleside. Scientific Publication **30**. 1975. £1.00.

The group of fungi dealt with in this publication began receiving attention in the early 1940s, when it was realised that they constituted an important and abundant mycoflora of submerged decaying leaves in ponds and, especially, in swiftly flowing streams. An extensive literature has developed since then, mostly scattered in scientific journals. Now Professor Ingold, a pioneer in the field, has brought together all the known British species (with some references to exotic forms) in one modestly priced volume.

Two complementary lines of investigation are described: the culturing of decaying leaves in petri dishes and the examination for conidia of samples of foam, which collects below waterfalls and in turbulent stretches of streams, which acts as an efficient spore trap. The various and often strange shapes of these conidia will attract the interest of the student from the outset, and the wealth of figures which accompany the descriptions will enable him to identify most of his finds. Not all of them however: of the hundred or so forms mentioned as occurring in Britain, about one third have only been found as conidia and consequently await formal description. Some may prove to belong to other fungal groups altogether. This shows how wide is the scope for original discovery in this field. A naturalist who uses a microscope and is attracted by the unusual subject will enjoy working with this book.

P. C. Holland

Survey of Bookham Common:

THIRTY-FOURTH YEAR

Progress Report for 1975

General (G. Beven*)

Members of the survey team led parties of the "Friends of Bookham Common" on a tour of the common on 8 June 1975, and Brian Spooner took them for a fungus foray on 19 October. The "Hobbies Group" of the Linnean Society was conducted over the common and welcomed to the Research Hut by Dr A. S. Thorley on 14 June. We are very grateful to Miss Dorothy Hayter for re-covering seven chairs in the Research Hut, and to Mrs J. D. Coombs and W. D. Melluish for gifts of money or books, and to A. E. Le Gros for books and a check list of invertebrates.

Vegetation (Ella M. Hillman†)

1. Plant lists are being made of Station Copse and along the streamside of Central Ditch by Miss J. Stoddart. In the former, where the tree layer consists almost entirely of elm *Ulmus procera*, much felling has been necessary as a result of Dutch elm disease. The opening up of this overgrown area has revealed a few more plants of the cut-leaved elder *Sambucus nigra* var. *laciniata*. It will be interesting to note the changes caused by the felling when the new list is compared with that of A. W. Jones in *Lond. Nat.* **38**: 61–63 (1959). The streamside flora is also subject to disturbance by cutting and public access.

2. The *Ruscus aculeatus* survey has been less interrupted in 1975 than in 1974, though with 91 clumps now marked it is not easy for the three observers to make all the planned visits. Nevertheless, a definite pattern of flowering and fruiting periods is emerging and seems to indicate insects as the pollinating agent but direct evidence of this is still lacking. It will probably be desirable soon to concentrate attention on certain female plants which show greater or less than average performance in fruit production. The maximum number of berries produced by any one plant in one season is five, as shown by observations from 1971–1975.

3. Eastern Plain. From an area of bracken *Pteridium aquilinum* over two metres tall this plain has been transformed by persistent swiping into a pleasant and accessible grassland. A few tenacious fronds and the bracken round the perimeter are a warning that the battle for conservation is not over, and invading birch and aspen also threaten the open state of this habitat.

4. Gun-pits and craters. Many on Eastern Plain are being cleared of shrubs and trees by the Keeper. This may restore them to the state of seasonal ponds, without aquatic flora, as they were in the original survey by Bangerter and Castell (in *Lond. Nat.* **28**: 51–56 (1949)), but the fall of the water-table will probably mean longer dry periods.

5. Fungi. The "Friends of Bookham Common" held a fungus foray on 19 October 1975 led by Brian Spooner, and the list of over 70 species found includes 18 species not included in the 420 previously listed for the common. The names of these 18 species will be put on display in the Research Hut, and later, we hope, there will be available a complete checklist, which Peter Holland is at present preparing.

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Vegetation: Hepatics (A. E. Le Gros‡)

I am able to amplify the distributional data of some of the wet habitat liverworts listed by Miss E. M. Hillman (*Lond. Nat.* **54:** 55 (1975)).

Lunularia cruciata (L.) Dum. This liverwort has spread in the last ten years about the streams and ditches on the western half of the commons in areas N.O.P.Q.R. Clearance of the ditches seems to have stimulated its growth. I found that the small freshwater snail *Potamopyrgus jenkinsi* helps to transport the gemmae of the liverwort up and down the stream in Central Ditch. The gemmae, which are sticky, adhere to the snail's shell in numbers from one to five.

Riccia fluitans L. This liverwort is undoubtedly transported, like duckweed, from pond to pond by water-fowl. A few years ago it was widespread on the common but the dry summers and the clearance of some of the ponds have affected it, and in 1975 I was able to find it only in Lower Eastern Pond.

Crustacea: Cladocera (John Hearn*)

Notes on the Cladocera for 1967

These results were obtained from samples taken on 12 January, 9 March, 11 May, 8 June and 9 November 1975. In the list the months in which the species were found are indicated by the number of the month in brackets, e.g. (11) – November.

The list includes seven species not previously recorded from Bookham Commons: *Ceriodaphnia pulchella* Sars, *Chydorus ovalis* Kurz, *Daphnia cucullata* Sars, *Ilyocryptus agilis* Kurz, *Pleuroxus aduncus* (Jurine), *Pleuroxus unicatus* Baird, *Sida crystallina* (O. F. Müller). In addition to these new records there are a number of species which have now been found in ponds from which they have not previously been recorded; these are denoted by an asterisk (*) in the text. This apparent increase in range may be due to the transfer of individuals on the net in the course of the present sampling programme. If this is the case there appear to be viable populations developing from these chance introductions. It is, however, more probable that these species have not been taken in previous samples although they were present, and this may well also be the case with the species that have not previously been recorded from the common.

Simocephalus exspinosus (Koch) has been found again this year in the same two ponds from which it was last recorded in 1957. Cladocera have been found in North Mark Oak Pond for the first time, although previous samples have been taken. This year samples from South Mark Oak Pond were, however, lacking in Cladocera. In November Crater Pond was visited but there was no standing water present and Nigel Davies informs me that many of the ponds have had reduced water-levels for part of the year. This could have produced changes in the fauna which may be indicated in next year's samples.

The acidity of the water was measured using narrow range pH papers and all the ponds gave values of pH 5.5 or 6.0, i.e. slightly acid.

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‡ Deceased; it is expected that an obituary will appear in the next issue.

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Three figure references are on the Castell Grid.

Bayfield Pond: *Ceriodaphnia reticulata* (Jurine)* (6), *Daphnia longispina* O.F.M.* (1, 3, 5), *D. obtusa* Kurz ♀ (1, 3, 5), *D. obtusa* ♂ (3), *D. pulex* (De Geer) ♀ (1, 6), *D. pulex* ♂ (6), *Simocephalus vetulus* (O.F.M.) (1, 3, 5, 6).

Bayfield Pond 2 (776): *Daphnia obtusa* (1, 3), *Simocephalus vetulus* (1).

Bayfield Pond 3 (762): This is a small pond to the north of Bayfield Pond. *Chydorus sphaericus* (O.F.M.), *Daphnia pulex* ♀ & ♂, *Pleuroxus aduncus*, *Simocephalus vetulus* (all 6).

Crater Pond: *Daphnia cucullata* (6), *D. longispina* (1, 3), *D. obtusa* ♀ (1, 3, 6), *D. obtusa* ♂ (3, 6), *D. pulex* * (1, 6).

Isle of Wight Pond: *Acroperus harpae* Baird (1, 3, 5, 6), *Alonella excisa* (Fischer) (5), *Ceriodaphnia pulchella* (6, 11), *Chydorus ovalis* (3), *C. sphaericus* (1, 3, 5, 6, 11), *Daphnia longispina* ♀ (1, 3, 5, 6), *D. longispina* ♂ (6), *D. pulex* (3, 5), *Eurycercus lemellatus* (O.F.M.) (1, 3), *Graptoleberis testudinaria* (Fischer) (1, 3, 5, 11), *Ilyocryptus agilis* (3), *Macrothyrix laticornis* (Jurine) * (5, 11), *Pleuroxus aduncus* (1, 11), *Scapholeberis mucronata* (O.F.M.) (5, 6, 11), *Sida crystallina* (11), *Simocephalus exspinosus* (Koch) (3), *S. vetulus* (1, 3, 5, 6).

Kelsey's Pond: *Chydorus sphaericus*, *Daphnia longispina*, *D. obtusa*, *D. pulex*, *Simocephalus vetulus* (all 1).

Lower Eastern Pond: *Chydorus sphaericus* * (5, 6, 11), *Daphnia longispina* ♀ (3, 5, 6, 11), *D. longispina* ♂ (6), *D. longispina* form "minnehaha" ♀ (5, 11), *D. longispina* form "minnehaha" ♂ (5), *D. pulex* ♀ (3, 5, 6, 11), *D. pulex* ♂ (5, 6, 11), *Leydigia leydigi* Schodler* (6), *Scapholeberis mucronata** (5, 6), *Simocephalus vetulus* (3, 6, 11).

Mark Oak Central Pond: *Chydorus sphaericus* (5), *Daphnia obtusa* * (5).

Mark Oak North Pond: *Daphnia obtusa* (5).

Sheepbell Hollow (375): *Chydorus sphaericus* (5).

Sheepbell Pond: *Chydorus sphaericus* (5).

South East Pond: *Chydorus sphaericus* (3), *Daphnia longispina* (5), *D. obtusa* ♀ (3, 5), *D. obtusa* ♂ (3), *D. pulex* ♀ & ♂ (3, 5).

Temporary Areas of Water:
Ditch near Isle of Wight Pond (813): *Daphnia obtusa* (1).
Pit on Eastern Plain (836): *Daphnia obtusa* ♀ & ♂* (3).
Pond in Stent's Wood (265): *Daphnia longispina*, *D. obtusa* *, *D. pulex* * (all 1).

Upper Eastern Pond: *Chydorus sphaericus* (3, 5, 6, 11), *Daphnia longispina* ♀ (5, 6), *D. longispina* ♂ (6), *D. longispina* form "minnehaha" ♀ (6, 11), *D. longispina* form "minnehaha" ♂ (6), *D. pulex* ♀ (3, 5, 6, 11), *D. pulex* ♂ (5, 6); *D. pulex* form "minnehaha" * (5, 6), *Leydigia leydigi* * (5, 6), *Pleuroxus unicatus* (11), *Scapholeberis mucronata* * (5, 6), *Simocephalus exspinosus* (3), *S. vetulus* (3, 5, 6, 11).

Addendum

Mr R. R. Fowell, Freshwater Recorder for the Surrey Naturalists' Trust, has given me the following records from the Isle of Wight Pond. The samples were taken from the south bank on 24 November 1975: *Chydorus sphaericus*, *Macrothyrix laticornis*, *Pleuroxus denticulatus* Birge, *P. trigonellus* (O.F.M.).

Crustacea: Copepoda (John Hearn)

Mr Fowell recorded the following from the south bank of the Isle of Wight Pond on 24 November 1975:

Acanthocyclops vernalis (Fischer), *Cyclops furcifer* Claus, *Eucyclops agilis speratus* (Lilljeborg), *Microcyclops gracilis* (Lilljeborg), *Tropocyclops prasinus* (Fischer) Schmeil.

Birds (G. Beven)

Population Studies in Oak-wood

The breeding season census was repeated in this 16 hectare (40 acre) sample of dense interior pedunculate oak-wood (Eastern Wood) in 1975. A summary of the twenty-seven year census appears elsewhere in this issue.

Population Studies in Scrub and Grassland

The breeding season census was repeated on 39 hectares (96 acres) of scrub and grassland in 1975 (G.B. and W. D. Melluish). The population of wrens is still increasing, reaching a total of 26 (compare 2 in 1964). There were two singing nightingales and two grasshopper warblers during the spring. Whitethroats have decreased from 13 in 1974 to 7; lesser whitethroat numbers however have been maintained (1974: 3, 1975: 4). Redpolls seem to be decreasing (1973: 5, 1974: 3, 1975: 1).

Other Notes on the Birds

A pair of little grebe built at least two nests on the Isle of Wight Pond, but they were unsuccessful. Several mandarin duck were present in spring. Mute swans nested on the Isle of Wight Pond and produced three young. There were several records of sparrowhawks between January and April. Woodcock nested successfully. A barn owl was present again in October.

Risks to Birds from Discarded Nylon Fishing Line

The keeper reports that during 1975 he collected many yards of nylon fishing line, left lying on the ground or thrown into bushes and trees round the Isle of Wight Pond. This line is a serious hazard to birds. In 1972 a blue tit was found hanged by nylon line (*Lond. Nat.* **52:** 81 (1973)). In 1975 Nigel Davies, the Keeper, found a dead young coot by the pond, with line tightly wrapped round its body and feet. On 21 January 1976 he found a carrion crow which had been dead for several weeks; it was suspended from the top of a small oak by a long nylon line tangled round both feet.

Mammals (G. Beven)

Of 27 rabbits killed at a shoot on 26 February 1975, none appeared diseased (Nigel Davies). A birch tree was found extensively stripped of bark by grey squirrels (13 July, ref. 892). On 12 April a summer nest of harvest mouse was found on Western Plain (ref. 468), a new locality on the common (Nigel Davies). There were records of roe deer (sightings or fresh tracks) in seven localities between February and July.

Changes in Breeding Bird Populations of an Oak-wood on Bookham Common, Surrey, over Twenty-seven Years

by Geoffrey Beven*

Summary

A breeding season census has been made annually since 1949 (except 1957) in a dense oak-wood on Bookham Common, Surrey. The results are discussed.

2. During this period 44 species occupied territories, 34 species fairly regularly. The number of territories varied from 123 to 210 (or 307 to 525 per 100 acres, representing perhaps 614 to 1050 birds per 100 acres, average 835), in the 40 acre sample.

3. Sparrowhawks were resident until 1959 but were then absent until 1973. Woodpigeons have increased. The tawny owl numbers seem to have remained fairly static. Green woodpeckers may have decreased slightly but great spotted and lesser spotted woodpeckers seem to have maintained their numbers.

4. Although great tits are increasing they are much less numerous than in woods with an excess of nest boxes. Blue tits seem also to have increased and the annual fluctuations tend to follow a general rather than a local pattern. Marsh tits are about three times as numerous as willow tits in the oak-wood.

5. The wren population usually decreased after winters with a continuous frost lasting three weeks or more. Substantial recovery occurred within two years but full recovery after the severe winter of 1962–63 took four years. 30 or even 50 per cent appear to remain in the woodland during the colder months; some birds leave in autumn and return in spring.

6. The average density of blackbirds is only a tenth of that in gardens. They usually remain in the wood throughout the year unless the winter is severe. Many blackbirds enter the wood to feed on caterpillars in May, while in autumn many woodland birds make excursions to the grass-scrub nearby to eat hips, haws and sloes. The blackbird appears to be the most important agent for the spread and regeneration of hawthorn in the oak-wood.

7. The spring robin population is large, but decreases after winters with continuous frost lasting two weeks. Less than 20 per cent of the robins remain in the wood between December and February. It seems probable that the movement out in autumn is a true migration before there is much food shortage and that many of these birds winter in gardens or near human habitation. They return mainly in March or April.

8. Garden warblers have declined in oak-wood since 1966 but since 1970 have increased on the scrub. Prior to this the average density of both blackcaps and garden warblers was about eight pairs per 100 acres. Willow warblers have declined since 1950 and are now almost absent from this part of the dense oak-wood. The decline is thought to be due to a natural increase in the density of the wood associated with a reduction in management. The chiffchaffs, always less numerous, have not shown a comparable decline.

9. Dunnocks tend to leave the wood in autumn and to return in spring. Starlings have nested in the wood since 1959. Large numbers come in to feed on caterpillars in May.

10. Chaffinches show a striking pattern of fluctuation with peaks in 1951, 1965 and 1972.

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Introduction

The London Natural History Society has continued to study the bird populations in dense interior oak-wood at Bookham Common, near Leatherhead in Surrey. A complete census of every species has been attempted in the spring of each year since 1950 (except 1957), and of some other species since 1946. Some earlier changes of population have already been discussed (Beven 1963). This paper brings these studies up to date and deals mainly with the breeding season population. This work is part of a long term survey (started in 1941) of the natural history of Bookham Common, which is situated about 20 miles (32 km) south-west of St Paul's Cathedral and is owned by the National Trust.

Habitat

On the common there are about 280 acres (112 hectares) of closed forest, typical mature pedunculate oak-wood on heavy London Clay with impeded drainage. A forty acre (16 hectares) sample of this woodland has been studied and named Eastern Wood by the survey team. It is about 1600 ft (530 m) long and 1100 ft (370 m) broad and ranges in height above sea-level from 150–230 ft (50–77 m). It is almost completely surrounded by dense oak-wood but there are two small ponds just outside the southern boundary, and some houses and gardens stand within 100 yards (33 metres) of one corner at the edge of the common. About two acres (1 hectare) are made up of open rides and spaces. In spite of the open spaces and adjacent ponds the wood is believed to represent a fair sample of interior oak-wood with minimum "edge" effect.

The vegetation has already been outlined (Steele 1947; Beven 1951, 1963) but a brief summary may be useful. The oak *Quercus robur* is dominant, and there are scattered birches *Betula* sp. but other trees are relatively scarce. The shrub layer is generally thick: hawthorn *Crataegus* sp. is common and often in dense thickets, while hazel *Corylus avellana* is locally abundant, and here and there are bushes of blackthorn *Prunus spinosa*, willow *Salix* sp. and holly *Ilex aquifolium*, sometimes forming thickets. Bramble *Rubus* sp. and bracken *Pteridium aquilinum* comprise the chief herb layer vegetation with some rose *Rosa* sp. and honeysuckle *Lonicera periclymenum*. Very few plants grow in the dense shade of the hawthorn. The footpaths are of grass with bare patches. Even in this small sample there is considerable variety in the density and type of the trees and shrubs (Beven 1951).

Up to 1951 trees were felled and sold from time to time to finance the upkeep of the common. In the winter of 1951–52 four acres (1·6 hectares) were thinned by the felling of some oaks and birches and shrub clearance. After this, in view of the proposed long term census of this part of the wood, the National Trust kindly agreed to leave it more or less undisturbed, and not to fell any more trees. As a result, the various small clearings from previous fellings became overgrown with the disappearance of grass. Encroachment of scrub caused much narrowing of rides and paths, sometimes to less than half the previous width, and the wood has gradually become more dense. These changes are believed to be responsible for the marked decline in the population of the willow warbler (see below and Fig. 6) and also perhaps for the disappearance of the lesser whitethroat after 1951 and whitethroat after 1968 (Table 1). As far as possible dead trees and branches have been left *in situ* to encourage hole-nesting birds and wood-boring insects.

However, a little clearing has been done subsequently in small areas. In 1955 three-quarters of an acre (0·3 hectare) of hazel in the north-eastern corner was coppiced, re-cutting about half an acre (0·2 hectare) in early 1975. Some further thinning of young oaks and birches with drastic clearance of bramble and other shrubs was carried out in another four acres (1·6 hectares) in the winter of 1961–62. In 1968 the National Trust acquired a Bush Hog Rotary Cutter and some of the paths were then cleared and widened. During the autumn of 1970 Hollow Path at the southern boundary was considerably widened with the felling of a number of large and small trees. The increased sunlight on this path encouraged the growth of brambles and rose and other plants at the edges. These local clearances however do not affect the fact that the wood as a whole has become considerably more dense over the twenty-seven years.

In the following account bird populations and feeding habits in the oak-wood may be compared with those on the adjacent grassland with thick scrub, dominated by tufted hair grass *Deschampsia cespitosa* and bracken. Here there are numerous shrubs of hawthorn, blackthorn and rose with scattered small trees, chiefly oak, birch and willow (see Beven 1964).

Method

The census technique is as already described (Beven 1951, 1963) and is essentially that used since 1961 by the British Trust for Ornithology in their Common Birds Census (Williamson 1964). The wood is visited repeatedly during March, April, May, June and July, often with extra visits in February and August. The position of each bird is marked on a large scale map (1: 2,500) with information regarding singing, nesting or carrying food. From a study of the constant positions or pattern of singing males it is possible to map the distribution of territories and hence to estimate their number. The final estimates have been made throughout the whole period by the author. In the earlier years a territory partly outside the boundary of Eastern Wood was recorded as half; in no case were more than three territories in this category. Since 1964 all the territory maps have been examined by the Population Section of the BTO for a "second opinion" before recording the final figures, and the BTO method of counting edge territories has been adopted, i.e. a territory with more than half the song registrations inside Eastern Wood is included but not one with less than half (Williamson 1964).

It is believed that these census figures give an indication of the breeding season population which can be compared from year to year. The results are shown in Table 1 which give the number of singing males with territories for each year for the whole period. In the discussion following, the results may be expressed as the number of territories, or as pairs, on the assumption that the males are mated, although this may not always be the case. In order to study the ecology of various species counts of birds have in fact been continued once monthly throughout the year for much of this time. Some of the breeding season results are compared with the BTO population annual index of the Common Birds Census (Bailey 1968; Bailey & Batten 1968; Batten 1971 (a), 1971 (b), 1972, 1973).

Significance of Results (Ella M. Hillman)

In a 27-year survey of natural events which have an annual cycle only 27 sets of results can be obtained. This is seldom enough to give results which are statistically significant at the usual levels of acceptance of probability, less than 1% ($P < 1\%$) that they are due to chance (or $P < 5\%$ for fairly probable). Obviously to extend the survey to obtain many more years in the sample is beyond the scope of amateurs. If the level of 15% probability of chance is accepted as evidence of a trend then some of these results may point to matters to which other surveys might profitably give attention. Moreover most environments change in a long period of time and the survey of the original habitat cannot be

TABLE 1. The number of territories of singing males of all species in 40 acres (16 hectares) of dense oak-wood (Eastern Wood) each spring. There was no count in 1957.
NC = No count. * = birds with large territories in which only part may be within the 40 acres.
Evidence of breeding in Eastern Wood or nearby, e.g., N = evidence of nesting, P = probably nested, U = uncertain.
0·5 = a male with only part of its territory in Eastern Wood.

Evidence of breeding		1946	47	48	49	50	51	52	53	54	55	56	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
N	Mandarin	NC	NC	NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	1	0	0	1
N	Sparrowhawk*	NC	NC	NC	1	1	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
N	Pheasant	NC	NC	NC	0	1	1	1	1	1	0	0	0	0	1	0	1	0	0	0	1	0	1	3	4	4	5	0	1	0
N	Woodcock*	NC	NC	NC	0	0	0	1	1	0	0	0	1	0	0	0	1	0	1	1	0	1	0	0	1	0	0	1	0	1
U	Stock dove	NC	NC	NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
N	Woodpigeon	NC	NC	NC	2	2	5	2	5	4	3	1	3	4	4	3	2	3	5	5	7	8	6	13	15	15	10	12	8	10
P	Turtle dove	NC	NC	NC	0	0	0	1	1	0	0	2	2	0	0	0	0	2	2	2	1	1	1	1	4	5	1	1	1	0
P	Cuckoo*	NC	NC	NC	0	2	0	2	1	2	1	1	0	1	0	2	1	1	1	2	2	1	2	1	2	2	2	2	2	1
N	Tawny owl*	NC	NC	NC	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
N	Green woodpecker*	NC	NC	NC	1	2	2	3	2	2	0	0	1	1	1	1	0	1	0	0	1	1	1	1	2	1	2	1	1	1
N	Great spotted woodpecker*	NC	NC	NC	1	2	2	2	3	3	2	2	2	1	2	2	2	2	2	2	2	3	2	3	3	3	3	3	2	3
N	Lesser spotted woodpecker*	NC	NC	NC	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	1	0	1	1	1	0	1	1	2	1	1
N	Carrion crow*	NC	NC	NC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	2	3	2	2	2
N	Magpie	NC	NC	NC	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	0	1	1	1	3	1	2	3	2	2
N	Jay	NC	NC	NC	2	5	6	6	5	7	4	3	4	4	4	4	3	4	7	4	5	5	3	4	7	7	8	5	4	5
N	Great tit	NC	NC	NC	6	8	8	8·5	11	11	10	12	4·5	11	12	12	11	12	17	17	12	16	19	14	13	13	12	18	19	17
N	Blue tit	NC	NC	NC	NC	6·5	13·5	9·5	13	16	10	14	13	10·5	16	18	16·5	19	19	22	17	16	20	19	20	15	16	19	26	19
N	Coal tit	NC	NC	NC	1	4	3	3	2	2	1	2	2	3	2	3	3	2	5	4	3	8	6	7	5	4	7	9	5	6
N	Marsh tit	NC	NC	NC	2	2	2	4	5	4	2	4	2	3	4	2	5	3	1	1	3	3	3	3	3	2	2	4	2	1
N	Willow tit	NC	NC	NC	1	1	0	1	1	1	1	2	1	0	1	1	0	1	0	1	1	1	1	2	1	1	2	2	1	1
N	Long-tailed tit	NC	NC	NC	1	1	2	2	1	2	2	2	2	0	1	1	2	0	0	1	2	2	1	1	2	3	2	3	2	2
N	Nuthatch	NC	NC	NC	0	1	3	1	2	2	3	4	1	4	4	3	3	2	5	5	5	7	5	3	5	5	4	6	5	4
N	Treecreeper	NC	NC	NC	1	2	0	2	2	1	2	1	1	2	3	1	3	1	1	2	2	2	4	4	3	5	3	1	2	2
N	Wren	NC	NC	11	17	20	20·5	18	10·5	14	11·5	7	16	13	14·5	17	12	1	5·5	11	17	25	26	24	25	17	26	27	27	30
N	Mistle thrush*	NC	NC	NC	0	0	0	1	1	2	0	0	0	0	0	2	2	2	2	3	2	1	1	2	2	2	2	2	1	1
N	Song thrush	NC	NC	NC	1	1	7	5	3	5	4	5	4	2	3	6†	5	4	7	7	8	10	7	7	7	9	6	6	6	4
N	Blackbird	4	NC	NC	5	9	9·5	11·5	8	12·5	8	7·5	11·5	9	7	9	8	8	10	12	11	12	11	13	9	14	12	6	12	12
U	Nightingale	NC	NC	NC	1	0	0	0	1	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0
N	Robin	24·5	19	24	22·5	28	28·5	30·5	33	30·5	23	24	32	29	23·5	27	32	21·5	32	37	37	42	43	44	36	44	37	35	38	33
N	Blackcap	NC	NC	NC	3	3	4	3	2	3	2	3	3	4	2	4	3	5	3	4	7	6	3	6	1	3	4	3	2	2
N	Garden warbler	NC	NC	NC	3	3	3	3	4	2	4	4	7	3	3	2	4	2	2	4	1	1	1	1	1	0	0	0	1	1
N	Whitethroat	NC	NC	NC	1	2	1	2	2	2	0	1	1	1	1	0	1	1	1	0	1	0	1	0	0	0	0	0	0	0
U	Lesser whitethroat	NC	NC	NC	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
N	Willow warbler	NC	NC	NC	16·5	21	16	15	15	11	8·5	17·5	12	5	2·5	2	1·5	2·5	1·5	4	4	2	6	2	2	0	0	0	0	2
N	Chiffchaff	NC	NC	NC	1	2·5	4·5	2·5	2	5·5	4·5	4·5	1·5	2	3	1	1·5	2	5	7	6	6	3	3	4	1	1	4	4	1
U	Goldcrest	NC	NC	NC	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	1	2	1	3	2	2
N	Spotted flycatcher	NC	NC	NC	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	1
P	Dunnock	NC	NC	NC	NC	2	2	2	4	1	2	4	1	2	0	1	4·5	4	5	5	4	8	6	6	3	2	1	0	3	1
N	Starling	NC	NC	NC	0	0	0	0	0	0	0	0	0	1	2	3	2	5	5·5	10	6	8	12	7	8	8	6	7	9	9
U	Hawfinch	NC	NC	NC	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
N	Greenfinch	NC	NC	NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0
U	Redpoll	NC	NC	NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
N	Bullfinch	NC	NC	NC	2	2	2	4	4	5	3	4	2	3	2	2	1	2	2	2	2	2	2	3	4	1	4	2	2	2
N	Chaffinch	6	NC	NC	9·5	11	12·5	9·5	9	8	8	6	4·5	2	2·5	4·5	7	5·5	7	8	7	6	4	4	3	6	8	3	1	3
	Total number of territories					151	164	160	159	156	128	142	140	125	126	137	141	123	160	188	181	210	209	206	204	200	200	195	192	186

† This revised figure differs from that in Beven (1963).

continued. It seems desirable, therefore, to pay some attention to trends which have only small probability of not being due to chance rather than dismiss them for that reason, since it is not possible to repeat such experiments and they do suggest to others in the future subjects on which to amass data to confirm or refute these suggestions. There are nonetheless some conclusions based on highly significant evidence and where $P < 5\%$ this will be stated as fairly significant, $P < 1\%$ as significant, and $P < 0 \cdot 1$ of 1% as highly significant.

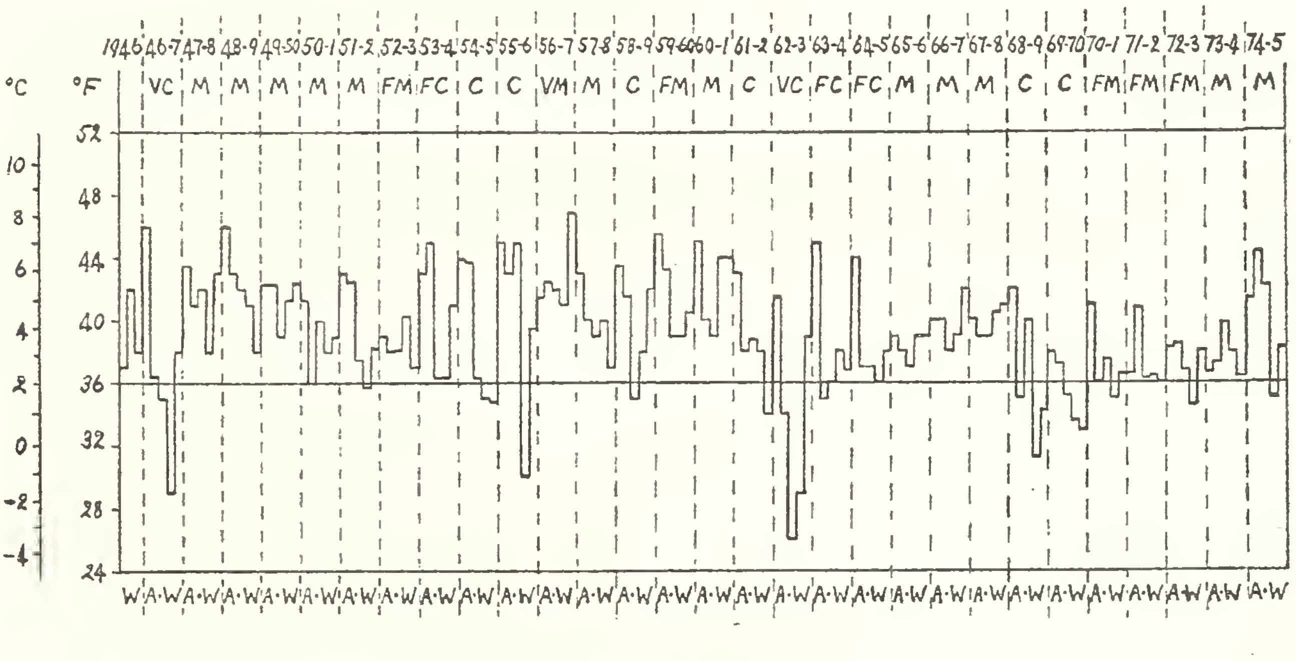
In the discussion of results there are further notes on their significance by Ella Hillman (E. M. H.) in parentheses.

Weather

Cold winters appear to reduce some bird populations, as shown by the census in the following spring. Therefore an attempt has been made to distinguish the mild and cold winters. Fig. 1 shows the monthly mean minimum temperature at Kew, Surrey, for the winters 1946–47 until 1974–75 inclusive. From this figure and other data such as cold spells, the winters have been classified as very mild (VM), mild (M), fairly mild (FM), fairly cold (FC), cold (C), or very cold (VC), though obviously the boundaries between these categories have at times been arbitrary. The longer cold spells are indicated in Fig. 2. These classifications are also indicated in Fig. 1, 2 and 3. Clearly other aspects of the weather are likely to affect bird populations but these have not been investigated.

FIG. 1. Classification of winter conditions at Kew from 1946 to 1975.

The mean minimum night temperature at Kew for each month of the autumn and winter (November to March) of each year from 1946 to 1975. A stands for autumn, divided into two sections corresponding to November and December, and W for winter, divided into three sections corresponding to January, February and March. The dotted lines represent breaks in the graph, the temperatures for the springs and summers not being shown. Winters are classified as very cold (VC), cold (C), fairly cold (FC), fairly mild (FM), mild (M), and very mild (VM).



Results

Forty-four species appear to have taken up territories in Eastern Wood during the spring (Table 1) and there is evidence that 35 of these species nested in or very near to this area of woodland, while three other species probably nested. Thirty-four of the species are usually present in the spring. The total number of breeding species in any one year varied from 28 to 36. The number of territories of singing males (1950–1975) varied from 123 to 210 in the 40 acres, or 307 to 525 per 100 acres (or perhaps 614 to 1050 *birds* per 100 acres, average 835, assuming all males were mated). This figure is considerably larger than the 500–550 birds per 100 acres suggested by Murton (1971: 111) for oak-wood but Williamson (1964) found 802 birds per 100 acres in Bagley Wood in spite of excluding individuals with territories only partly in his 44 acre sample. A previous figure of at least 320 to 500 birds per 100 acres in Eastern Wood was based on average counts of birds present in the spring (Beven 1956) but the number of territories of singing males seems to give a more accurate estimation of the total population. Of course there are occasions when the population is greatly increased by invasions of many starlings and blackbirds, with smaller numbers of jackdaws and house sparrows, feeding on the enormous crop of caterpillars in May. The total population seems to have increased somewhat in the past 11 years. Figures of under 130 territories occurred in four breeding seasons, in 1955, 1959, 1960 and 1963, and on three of these occasions the previous winters were cold.

1. Sparrowhawk and Woodpigeon

Regularly each spring a pair of sparrowhawks circled in their display flight over the wood; they nested in the adjacent woodland. However, after 1959 they were not seen, except for an occasional bird outside the breeding season, until 1973. Over many parts of Britain the sparrowhawk decreased markedly in 1959–60 as a result of the widespread use of chlorinated hydrocarbon pesticides (Parslow 1967–68).

During the last eight years woodpigeons have increased from between 1 and 5 territories to between 6 and 15. Flocks of several hundred enter the wood in winter, especially when the acorn crop is good, and then they may be found feeding on the ground, although usually they keep to the canopy, seemingly resting after feeding in the surrounding farmland (Beven 1956). Similarly Yapp (1962) considered it rare to find more than a few birds in spring at that time, even in a large oak-wood.

2. Cuckoo and Tawny Owl

The figures do not suggest any evidence of a decline in the number of cuckoos and there are usually one or two territories. Although young cuckoos have not been seen in the wood, a dunnock has been observed feeding a young cuckoo in the open scrub nearby.

Tawny owls were found in every year between 1949 and 1975 except in 1949 and 1963. Their territories in oak-wood apparently vary from 30 to 80 acres in size (Southern 1970). With species having such large territories it is difficult to estimate the variation in numbers from a study of an area as small as 40 acres. However over the whole 280 acres (112 hectares) of oak-wood at Bookham there appeared to be 4 territories in 1965, 4 in 1966, 3–4 in 1967, 5 in 1968, 4–5 in 1969, and 5 in 1970. In these years therefore their numbers seem to have remained largely unchanged, as has been found in most parts of Britain in recent years (Parslow 1967–68).

3. Woodpeckers and Crows

Green woodpeckers may perhaps have declined slightly in numbers, a change possibly associated with the increased density of the wood, as this bird prefers more open woodland. Since 1949 there have usually been parts of two territories of great spotted woodpeckers each year, occasionally only one, but there were probably three pairs in 1953, 1954, 1967, from 1969 to 1973 and in 1975. This species may therefore be increasing. The lesser spotted woodpecker records are erratic but this bird is easily overlooked, being rather inconspicuous and quiet when few are present. It appears however that there has usually been one pair in recent years. All three species have at least attempted to nest in this wood.

Carrion crows, magpies and jays are resident, but in such a dense wood it has not proved possible to make an accurate census with their rather ill-defined territorial "song". Magpies and jays are often numerous, gathering in parties in early spring; jays then make quiet musical mewing notes and fly about with noisy parrot-like cries and rasping noises.

4. Great, Blue and Coal Tit

In the early years the great tit population remained remarkably stable apart from a reduction in 1958 followed by a rapid recovery (Beven 1963). There seems to have been some increase in numbers in the last twelve years. The maximum population was 19 pairs (48 pairs per 100 acres). There are no nest boxes at Bookham so the population of great tits is limited by the number of natural nest-holes, which no doubt increases as the trees age. In other broad-leaved woods with rich undergrowth, where an excess of nest boxes ensures that some are always vacant, the great tit population may be very much greater. Apparently in these circumstances few great tits nest elsewhere (Lack 1955). Thus at Marley Wood, Wytham, Berkshire, and in the Forest of Dean, Gloucestershire, there have been 136 pairs per 100 acres (Campbell 1968; Lack 1966), and at Alice Holt, Surrey, 72 pairs per 100 acres (Lack 1955). At Bookham the population varied between 4·5 and 19 territories. A rather similar range of variation occurred in some of the woods equipped with nest boxes, such as in the Forest of Dean (16 to 75 pairs), Alice Holt (14 to 54 pairs) and at Hamsterley Forest, Co. Durham (11 to 30 pairs). On the other hand in Marley Wood the fluctuations were much greater (7 to 86 pairs).

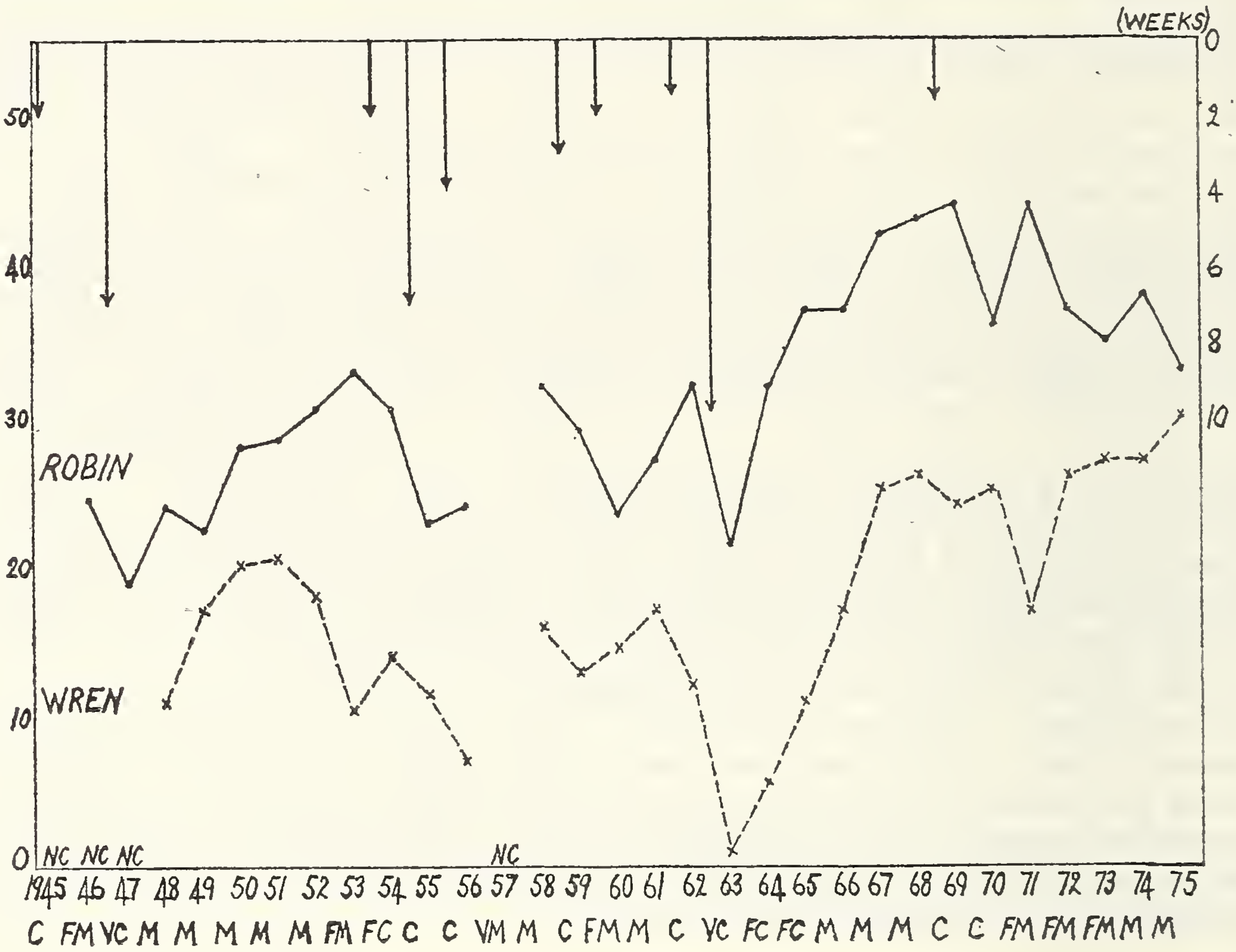
Blue tits are difficult to census accurately and the figures may well be only rough estimates. However the birds do seem to have increased in the early nineteen sixties, possibly because of increasing numbers of nest holes. Comparison of our figures with those from other sites (Beven 1963) and with the BTO population annual index for Britain from 1964 to 1972 suggests that the year to year fluctuations at Bookham follow a general rather than a local pattern. Coal tits vary between one and nine pairs.

5. Marsh, Willow and Long-tailed Tit; Nuthatch

Between 1949 and 1975 marsh tits varied from 1 to 5 pairs, average 2·8 (or 2·5 to 12·5 per 100 acres, average 7) and willow tits from 0 to 2, average 1 (or 0 to 5 per 100 acres, average 2·4). When the territory maps for the whole period are compared, 15 out of the 26 willow tit territories appear not to overlap with those of the marsh tit in the same year, although there is at least partial overlap in the remaining 11 territories. This suggests a degree of horizontal spatial separation which may help the two species to co-exist in Eastern Wood during the breeding season. In the south of England the habitat of the willow tit seems not to be clearly distinguishable from the marsh tit's, although willow tits are said to prefer damp wooded commons especially if there are rotten boughs or stumps in which to bore a nest hole. The willow tit's preference for a wetter habitat seems to be borne out by the fact that over 26 years, 18 out of 26 of their territories (69%) were situated in the more low-lying and damper southern half of Eastern Wood, while those of the marsh tit seem more evenly distributed, only 34 out of 72 (47%) being in the lower part of the wood (see Beven 1973). However the numbers are small and the differences may not be significant. (P around 15%, E.M.H.).

There is no evidence that tits of the genus *Parus* were reduced in numbers after the severe winters. On the other hand long-tailed tits were absent in 1959 after a cold winter, and in 1963 and 1964 after the very severe winter of 1963. One, two or three pairs were present in every other year. Nuthatches (0 to 7 pairs) have become rather more numerous in the last twelve years.

FIG 2. The number of territories of singing male robins and wrens each spring. The vertical arrows signify the length of cold spells in January, February and early March (lasting 10 days or more) in weeks. (Scale at right of graph.)
NC=no count for that year.
Symbols representing classification of winters: VM=very mild. M=mild. FM=fairly mild. FC=fairly cold. C=cold. VC=very cold.



6. Wren

The populations of woodland wrens in spring were profoundly affected by the severity of the previous winters (Fig. 2). Cold spells influenced their numbers more markedly than low mean monthly temperatures. From 1948 to 1965, a period containing in all seven winters with continuous frosts lasting two weeks or more, the number of territories held each year ranged from 1 to 20·5 with an average of 13·1. Perhaps the cold spells were too frequent to allow complete recovery. On the other hand, from 1966 (when recovery from the hardest winter was almost complete) to 1975, the number of territories ranged from 17 to 30 with an average of 24·4. This period contained two cold winters but no prolonged frost. The difference is highly significant ($P < 0{\cdot}1$ of 1% E.M.H.). Furthermore after each of four long frost spells lasting three weeks or more there was a drop in wren numbers ($P < 2{\cdot}5\%$ E.M.H.) and the probability of 4 out of the 9 decreases following on such a winter by chance is $< 6\%$ (E.M.H.). Incidentally the number of wrens was low in 1948, presumably because of the severe winter of 1947, but they increased until 1951 after four mild winters. Since 1961 the Bookham woodland figures show very similar fluctuations to those indicated by the BTO index of common birds in Britain (Hawthorn & Mead 1975).

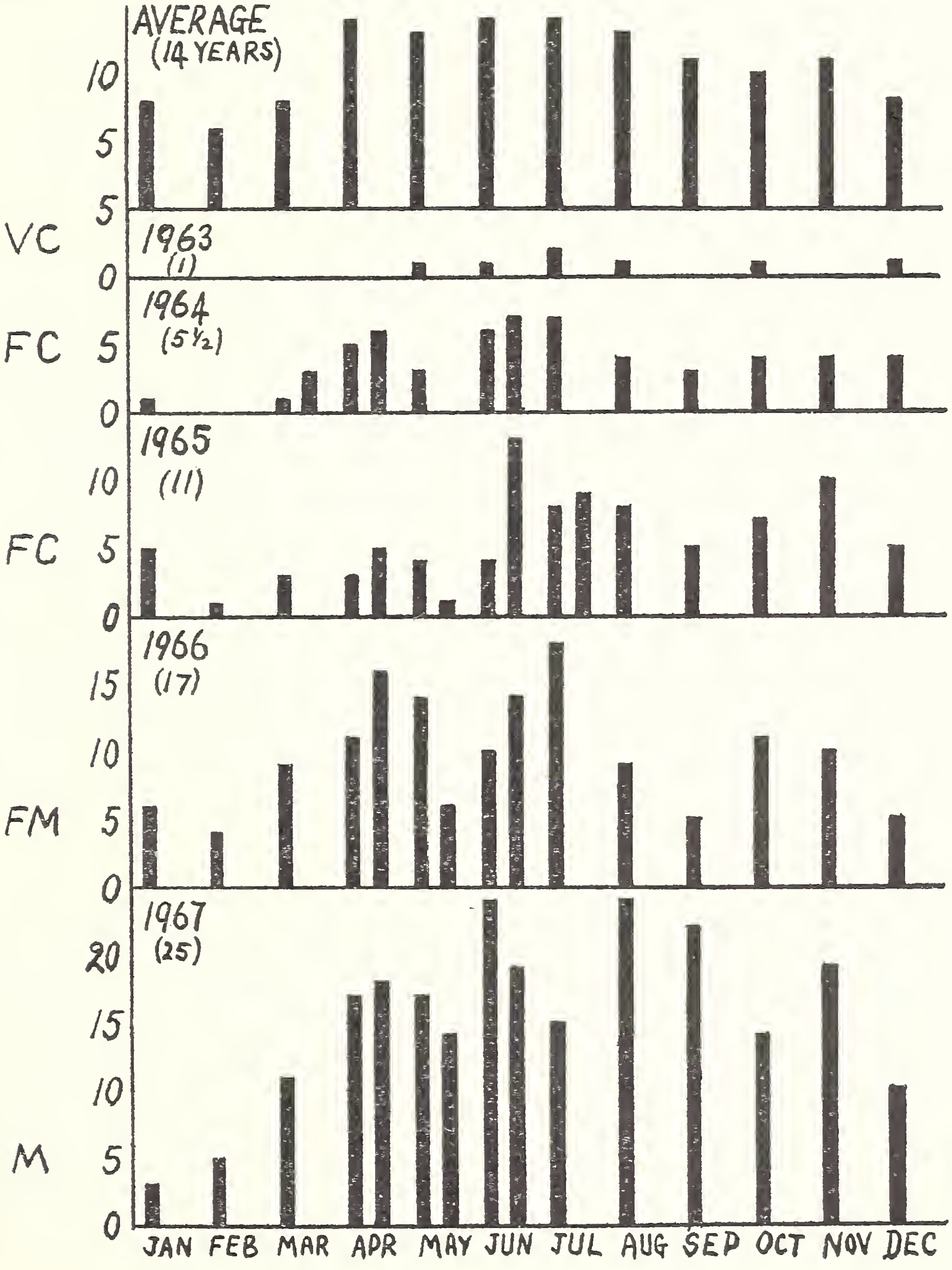
FIG. 3. The variation in the wren population in Eastern Wood throughout the year.

The average count of wrens each month over the 14 years (1949 to 1955 and 1967 to 1973) are compared with the monthly counts for the years 1963 to 1967 shown separately, and illustrate the recovery of the wren population after the severe winter of 1962–63.

Key: The height of each black column represents the maximum number of wrens counted in the 40-acre oak-wood at a monthly visit. Where there are two columns in a month, two separate counts were made.

The figure in brackets under the year is the number of territories of wrens present during the spring of that year.

The letters in the left-hand margin represent the severity of the winter preceding the spring of the year stated. VC=very cold. FC=fairly cold. FM=fairly mild. M=mild.



Many of the wrens, at least 30 per cent (perhaps 50%), remain in the wood throughout the colder months feeding mainly on the ground or in the herb layer. This is demonstrated in Fig. 3 which shows the number of wrens counted in the wood each month during the years 1963 to 1967, and the average number during the 14 years from 1949 to 1955 and 1967 to 1973. These figures also indicate an immigration of some wrens into the wood in March and April, and some disappearance, probably exodus, in the autumn (September to December). There may also be a further drop in numbers during January and February either due to more wrens leaving or perhaps to some dying in the wood. Armstrong (1955) states that some birds, particularly those hatched the previous year, are driven out in the early months of the year.

It was only after the near extermination of wrens in 1963 that it became clear that wrens entered the wood in spring and not in autumn when young birds might perhaps have been expected to disperse and occupy vacant territories there. In fact it appears that in this oak-wood most territories usually remain occupied during the winter. For instance, in seven out of eight years when winter counts were made, of those territories which were occupied in the following spring, from 50 to 95 per cent were occupied also during the previous winter by at least one bird, often a singing male. In the remaining winter only 28 per cent of territories were occupied. It seems likely that the wrens leaving the wood in autumn are mainly first winter birds, which tend to disperse widely (Armstrong 1955, Hawthorn & Mead 1975).

In considering the effect of severe winters on the wren numbers it is important to realise that the periods of continuous frost have been measured outside the woodland, within which there is a more equable less severe climate. Although the wren by reason of its small size is very vulnerable to sudden falls of temperature through loss of body heat, it seems to take three weeks of the severe conditions outside the wood before the wren population, mostly inside the wood, is seriously diminished. The sheltering effect of woodland is well known: by keeping down the effects of bitter winds it would appear to ward off severe frost for several days. Wrens already established in woodland territories probably remain in them. They are by then well acquainted with the nooks and crannies which their small size enables them to explore to find the small hibernating invertebrates, foraging at times under snow-laden leaves and tufts (Armstrong 1955) notwithstanding that most of their feeding is usually done in the herb layer (Beven 1959). They also know which holes and old nests are suitable as roosting sites, knowledge which is of survival value in cold weather. On the other hand some first-year birds, not yet established in territories and therefore probably without this vital information, appear to leave in autumn and spend the winter elsewhere. These or other birds enter the wood in spring and occupy vacant territories or find unmated males.

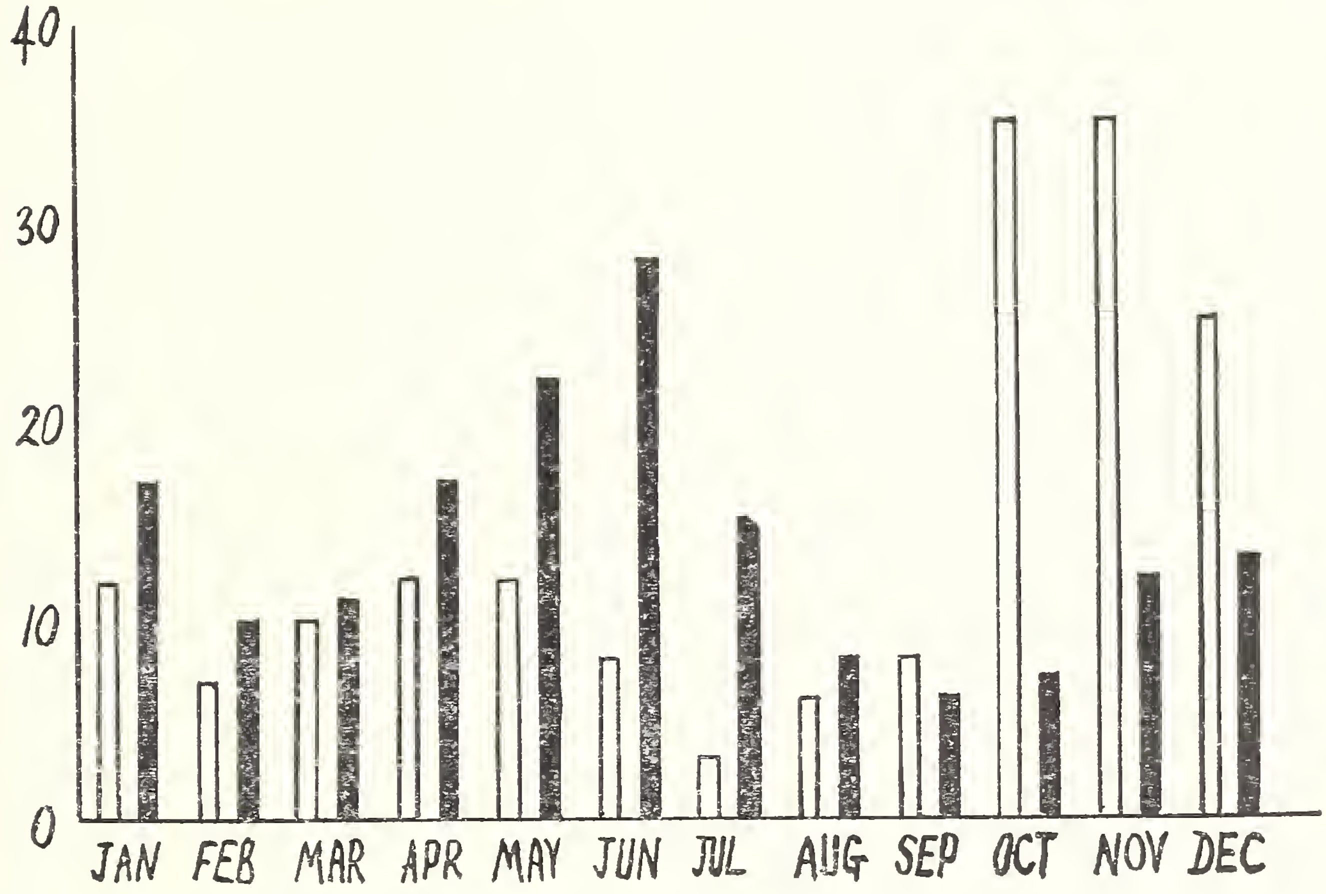
7. Thrushes

The territories of mistle thrushes are large, but there are often parts of one or two in the 40 acres. They seem to have left the wood by July and usually return in February although a few may sometimes be present in December. The song thrush territories varied from one to ten (2·5 to 25 pairs per 100 acres). In pedunculate oak-wood at Badby, Simms (1971) estimated 4 to 6 pairs per 100 acres whereas 55 birds were found per 100 acres in deciduous woodland by Williamson (1964). Song thrushes are largely absent from Eastern Wood during the winter, returning to breed from March onwards; most have gone again by September. The average monthly figures for the nine years 1949 to 1955, 1964 and 1965 were: Jan. 0·1, Feb. 0·1, March 0·8, April 1·1, May 2·1, June 3·9, July 0·7, Aug. 0·3, Sept. 0·1, Oct. 0·1, Nov. 0·1, and Dec. 0·3. The numbers are small but the annual pattern was repeated in seven years out of nine. Snow (1965) rarely saw song thrushes in winter in Marley Wood (oak-wood) except when fruit and earthworms were especially abundant in November and December 1956, some song then being heard. On the other hand in the Botanic Garden, Oxford, the males were largely resident in their territories throughout the year although 80 per cent of the females left theirs in July, mostly returning in March.

Fig. 4. The average number of blackbirds counted each month in 40 acres of dense oak-wood and 35 acres of scrub and grassland.

Black columns = average number in oak-wood over 11 years (1949–1955 and 1964–1968).

White columns = average number in scrub and grassland over 9 years (1965–1973).



8. Blackbird

The breeding population of blackbirds has varied between four and 14 pairs (10 to 35 per 100 acres, average 24). This average density is only about one-sixth of that in isolated oak-woods in London suburbs (Roberts & Edwards 1974) and one-tenth of that in gardens (Snow 1958). Over the period there has been little overall population change, perhaps a slight increase, but not as much as might be expected in view of the decrease in annual mortality of blackbirds from 50% down to 32% in Britain between 1951 and 1961 (Snow 1966a). The Eastern Wood figures may be compared with 13 to 18 pairs per 100 acres in oak-wood at Badby (Simms 1971) and 64 birds per 100 acres in oak-wood elsewhere (Williamson 1964). Lack (1966) points out that the figure for Eastern Wood in 1954 (12·5 pairs) was up to that time the highest recorded in woodland, although this figure has since been exceeded there, in 1969 (13) and 1971 (14). It has been suggested that the oak-wood blackbirds sometimes decreased after cold winters (Beven 1963) but we have not subsequently found any confirmatory evidence of this. Blackbirds remain in the dense oak-wood throughout the winter unless it is extremely severe, as in January 1963. But there are regular seasonal movements in and out of the wood (Fig. 4). The numbers increase in April and May, presumably due to breeding, but later in May and in June other birds enter the wood to collect the caterpillars descending from the trees to pupate among the leaf litter. These caterpillars are taken mainly from the ground but also from threads as they dangle a foot (30 cm) or so off the ground, and also from the canopy. When this crop is exhausted many blackbirds leave and those that remain go into moult and become silent and skulking. During the summer and autumn no doubt many birds leave their woodland territories to feed on fruit crops in nearby gardens and orchards, e.g. plums, apples and cherries, perhaps up to 0·25 mile (0·4 km) away (Snow 1958). In October and November large numbers certainly visit the scrub adjacent to the wood to feed on the abundant crop of hips, haws and sloes, mixing then with other blackbirds, redwings and fieldfares.

It is now realised that during the autumn many woodland blackbirds make regular excursions to the heavily-laden hawthorn bushes on the nearby scrub, swallow the haws and then return to the wood. Previously it had been considered doubtful whether woodland blackbirds ate many haws (Beven 1963) but it now appears that they do so by frequently feeding outside the wood at this season. Blackbirds certainly eat many haws (Beven 1964; Hartley 1954) and some have been observed to fly into the wood immediately after swallowing these berries. The hawthorn seeds are passed through the bird undigested and distributed with the droppings throughout the woodland as the birds return to their territories. Thus the blackbird appears to be the most important means of spread and regeneration of the hawthorn in the dense shade of the oak-wood where these shrubs produce very little fruit of their own, but where seedling hawthorn plants are abundant and widely distributed. At Bookham the blackbird seems to be the only bird likely to distribute the seeds throughout the wood. Other species such as fieldfares *Turdus pilaris* and redwings *Turdus iliacus* eat haws but roost together in thickets or perhaps in parts of the wood but would not usually disseminate seeds evenly throughout the wood. Song thrushes and mistle thrushes do not return to their territories in the autumn. Small mammals such as wood-mouse *Apodemus sylvaticus* and bank-vole *Clethrionomys glareolus* indeed carry haws to their larders, but recent studies suggest that they normally only travel about 30–40 metres (Ashby 1967; Southern 1964), so that although they appear to be important for the dissemination of some tree seeds, it is doubtful whether they could distribute haws evenly in a large wood such as this.

Blackbirds spend more of their time in the wood in December and January. Throughout the year while in the wood they feed almost entirely among the leaf litter (Beven 1959). If this leaf litter is completely hidden under deep snow they may be forced to leave the wood, but this only happened once during the 27 years: in January 1963. Thus by their habit of turning the leaves to expose hidden invertebrates, sometimes digging down several centimetres, blackbirds are able to find enough to eat throughout the cold months. Robins and song thrushes however do not turn over the leaves and this may be why many of them move out of the wood after breeding.

9. Robin

Robins breed throughout woodlands and, although commonest at the edges, occur deep inside as well (Lack 1965). In our 40 acre sample of interior oak-wood there is a large population of robins in the spring, varying between 19 and 44 pairs (48 to 110 per 100 acres). In oak-wood at Marley, Wytham, there are on average 30 pairs per 100 acres, and about twice this in a narrow copse at Dartington, where in scrub and orchard the population rose to 100 pairs per 100 acres (Lack 1965). In 96 acres of mixed scrub on grassland at Bookham adjacent to oak-wood there were only about 21 pairs on average over the ten years 1964 to 1973.

It now seems that as in the case of wrens one of the most important factors controlling the oak-wood population is the severity of the preceding winter, particularly the lengths of periods of continuous frost (Fig. 2). Between 1946 and 1964 there were seven winters with continuous frost lasting two weeks or more and during this period the average number of territories held each year was 26·9 (ranging from 19 to 33), while between 1966 and 1975, a period with two cold winters but no long frost, the average was 38·9 (ranging from 33 to 44). This difference is highly significant at the level P 0·1 of 1% (E.M.H.). Furthermore after six of the seven winters in which the frost lasted two weeks or more, the population was reduced, whereas after five winters classed as cold or fairly cold but without such long spells of continuous frost, the population actually rose in four cases. (In the first case $P < 2\%$, the second case is not significant. E.M.H.). Of the ten occasions when the population was reduced, six were preceded by long frost winters, and as in the period under consideration there were only seven such winters, this is also fairly significant, P being just over 5% (E.M.H.). These results indicate a high probability that a long continuous frost of at least two weeks will be followed by a drop in numbers of robins and that such spells are the main cause, though not the only one as Fig. 2 seems to show. Lack (1965) was surprised that our robin population rose in the spring following the cold winter of 1961–62. However, although this winter was very cold over much of England and average temperatures at Kew were low, especially in March, nevertheless the mean minimal temperature for January and February were not exceptionally low at Kew where there was less than two weeks of continuous frost. Comparison of graphs of robin and wren numbers show a tendency for corresponding changes to occur.

The continuous frost periods were measured outside the woodland, within which the climate is less severe. The ground inside the wood is usually soft and exposed, whilst outside it is frozen and snow-covered. However we have found, over the years, that less than 20 per cent of the robins remain in the wood between December and February. Thus the more severe wintry conditions outside the wood appear to be largely responsible for the reduction of robins.

Robins seem to start leaving the wood in autumn (Fig. 5) but they are very difficult to count in July and August while silent and skulking in moult. Fig. 5 shows the average number of robins counted each month. The totals for April and May are almost entirely of singing males; the females tend to get overlooked. But even assuming only two-thirds of the males to be mated, there are probably at least 50 birds in these months. In autumn however some females may sing so that the figure of 20 is likely to be nearer the actual number present. Thus by September—October the number of robins is usually reduced to half or even a third, and there is the further reduction to 20 per cent by December.

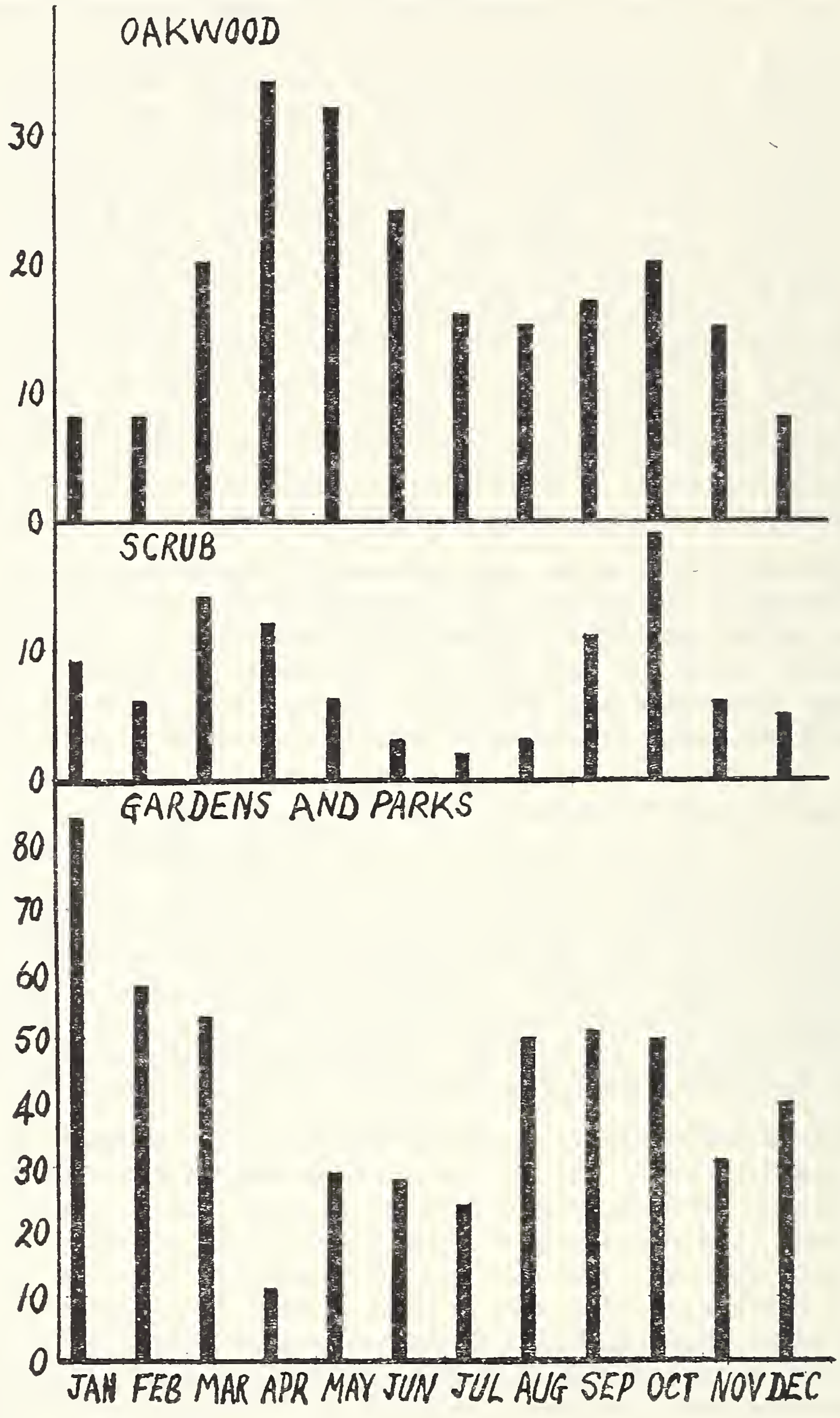
This exodus of robins from the wood seems to be associated with a shortage of food during the winter. At that season they take over half their food from the ground (Beven 1959), feeding on beetles and other insects, spiders, centipedes and earthworms, and the supply of them is largely cut off when the ground is frozen or snow-covered. However this very seldom happened in the dense oak-wood at Bookham. But even in mild winters, long before the ground is frozen, it is known that the leaf-litter fauna becomes scarce, going deeper into the ground and becoming largely inaccessible to the robins, especially as these birds do not attempt to turn over the leaf litter to look for them (Elton 1966; Lakhani & Satchell 1970; Macfadyen 1963; Manns 1967; Neal 1958; Shillitoe 1963). Dry weather in summer also drives the leaf litter fauna deeper (Manns 1967) so that young robins may well be the first to leave the wood since they are very seldom seen within it. However most robins leave the wood before there is any obvious shortage of food, so that the movement seems likely to be a true migration (Lack 1965). Where the robins which leave the wood spend the

FIG. 5. Seasonal variation in numbers of robins.

(i) Oak-wood. The average number of robins counted in Eastern Wood (40 acres) each month over 11 years (1949–1955, 1963–1966).

(ii) Scrub. The average number of robins counted on Central Plain (35 acres) each month over 9 years (1965–1973).

(iii) Gardens and parks. The *total* number of full-grown robins trapped in various gardens and parks each month. Mist nets and baited traps were used. Juveniles and "re-traps" were not included.



winter is not certainly known, but ringing returns for the country as a whole suggest that most do not move far afield, although some from the south-east of England do reach south France or even Spain (Snow 1966b). It seems likely that most stay locally, finding sufficient food in gardens, parks and farmland, especially where the ground surface has been dug and disturbed, thus exposing the small creatures on which they feed. Bird tables, scrap heaps and fowl runs are no doubt useful additional sources of food. Fig. 5 compares the seasonal variation in numbers of robins in different habitats. In scrub adjacent to the wood the numbers seem low in winter but begin to increase early in the year with a peak in March, perhaps a month earlier than in the interior oak-wood (Beven 1953). Lack (1965) considered that robins bred 1–2 weeks later in woodlands than in gardens, where they are often resident throughout the year. In scrub from May to July robins seem scarce or are perhaps difficult to find while moulting, but some may have already left the area. There are more robins in September, with the highest peak of the year in October, possibly indicating a passage of birds from the nearby woodland, although a resurgence of song from birds of both sexes means an increase in conspicuousness. Fig. 5 also confirms that more robins are present in gardens and parks from late summer to March, a period when they are least numerous in woodland, suggesting a transfer of the population. The data for gardens and parks was collected from various ringers working on sites in Surrey and London.

10. Blackcap and Garden Warbler

In the period 1949 to 1975 blackcaps averaged 3·3 pairs (8·25 per 100 acres) and garden warblers 2·3 (5·75 per 100 acres) giving a ratio of about 3: 2. However there were considerable variations in number from year to year, blackcaps varying from 2·5 to 17·5 pairs per 100 acres and garden warblers from 0 to 17·5 pairs per 100 acres. Garden warblers have declined in the oak-wood since 1965, perhaps for local reasons as they seem to have increased in the scrub since 1970. Incidentally, overall in Britain there has been a tendency for garden warblers to decrease on both farmland and woodland since 1968, possibly related to severe drought conditions in their wintering areas in west Africa (Winstanley *et al.* 1974). Thus if this recent period of decline of garden warblers is excluded, between 1949 and 1965 blackcaps averaged 3·2 per 40 acres (8 per 100 acres) and garden warblers 3·3 (8·25 per 100 acres) i.e. a ratio of 1: 1, see Table 1.

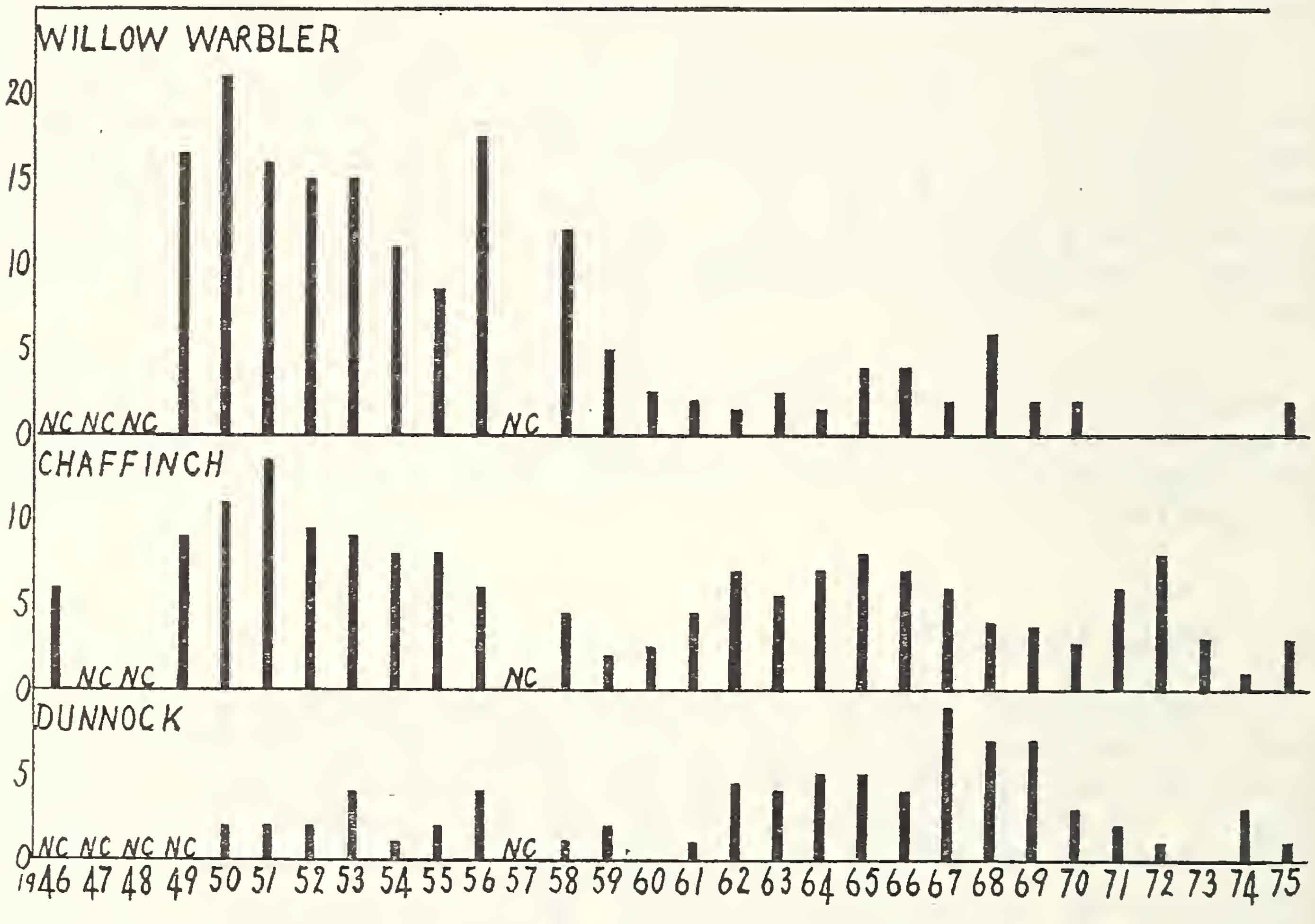
The density of garden warblers on Bookham Common seems on average to have been about twice as great in oak-wood with shrubs (5·75 per 100 acres) as in scrub with scattered trees (2·7 per 100 acres). The density of blackcaps is on average 2·5 times as great in oak-wood (8·25 per 100 acres) as in scrub (3·1 per 100 acres).

11. Willow Warbler

The willow warbler population has slowly declined and disappeared since the peak of 21 territories in 1950. Except for a temporary increase in 1956–58, the downward trend has been fairly steady until 1971 when there were no territories (Fig. 6). As rather similar decreases had been noted elsewhere, it was thought at one time that the decrease in oak-wood at Bookham could have been due to general changes in the population (Beven 1963). However it was clear that there had been no corresponding decrease on Bookham Common outside the woodland, nor was a general decrease suggested by the Common Bird Census of the BTO, nor by Yapp (1969) in his study of oak-wood birds, nor by Parslow (1967–68). The structure of the wood was therefore re-examined. Comparison of aerial photographs taken in 1948 and 1961 indicated clearly that grass-covered rides and paths in the wood were wider in 1948 than in 1961, and examination on the site confirmed that many paths had decreased in width by perhaps 5 or 6 metres owing to encroachment by birch and other scrub. More important no doubt was the increase in density of trees and spread of canopy with obliteration of some small clearings associated with the policy of not felling any more trees. In one area in particular, in 1950 there had been 12 willow warbler territories, but by 1961 there were none. As a result of these changes in the wood the total area of grass has decreased. Willow warblers' nests are characteristically half sunk in the ground among grass and dead bracken, while continuous bramble and closed tree canopies are generally avoided (Campbell 1953). Thus the area suitable for nesting has apparently been considerably reduced and the willow warbler decline can therefore be attributed to the natural regeneration of woodland.

This is a good demonstration that a wood left to regenerate and become dense may cease to hold a species which requires some open woodland and for which occasional felling and widening of grassy paths seems necessary. In fact some path widening has been done since 1965 and a very slight recovery is perhaps occurring, but the willow warbler population seems to have almost died out. It is probably significant that in 1965 and 1966, three out of four territories were close to grass-covered paths, in 1967 both of the two, in 1968 all of six, and in 1969, 1970 and 1975 both of the two territories were near grassy paths.

FIG. 6. The number of territories of singing males each spring, of willow warbler, chaffinch and dunnock in the 40 acre sample of dense oak-wood, Bookham Common, Surrey. NC=no count.



12. Chiffchaff

The numbers of chiffchaffs have varied between one and seven but have remained small relative to the peak numbers of willow warblers. Until 1958 the latter considerably outnumbered the chiffchaffs and a similar predominance of willow warblers has been observed in oak and beech woods in Wyre Forest (Yapp 1969) and at Chislehurst (Hillman 1958). Although the population has varied, chiffchaffs have not shown any tendency to disappear from the wood, perhaps because they are less dependent on grass for nesting than the willow warbler. The density of between 3 and 18 pairs per 100 acres in oak-wood at Bookham may be compared with 11 in Bagley Wood and from 2·5 to 3·5 at Badby.

13. Dunnock and Starling

A few dunnocks occupy the more open areas of the wood in spring. They tend to leave the woodland in autumn, although odd birds may be present in January and February. By March and April they have returned, the numbers being maximal from April to July. There have been up to eight pairs in the wood (20 per 100 acres) which might be compared with 5·5 pairs per 100 acres at Badby (Simms 1971). As in the case of the chaffinch (see below), since 1950 there has been some waxing and waning of the population, with peaks in 1953 and 1956 followed by a more steady increase in population from 1962 until 1969, with a peak in 1967, declining since (Fig. 6). It is perhaps interesting to note that the increase in 1962 came very quickly after some clearance of shrubs and thinning of young trees in about four acres (1·6 hectares) during the winter of 1961–62. This change in habitat seems to have favoured the dunnock as over the next six years (1962–1967) about half of their territories included some of the "cleared" areas. After 1967 the habitat became more dense as no more clearing was done. There were also high populations in the adjacent grassland with scrub from 1964 to 1969 with a peak in 1967, and little evidence of much decline since.

Prior to 1959 the starling had not been found nesting in the interior of the oak-wood, although it frequently occupied woodpecker or natural holes on the outskirts. In 1959 however, starting with one nesting pair, numbers gradually increased to a maximum of 12 in 1968. A few starlings are present throughout the year. They apparently begin to occupy their breeding territories in September, the numbers gradually building up during the winter and then more rapidly in April. In late May the canopy is invaded by hordes of starlings feeding their young on the abundant crop of caterpillars. The birds depart some two weeks later when this food supply is exhausted. The young birds seem to leave their nests in early June, rather later than those hatched in gardens.

14. Chaffinch

The peak of chaffinch population was in 1951, after which it gradually declined to a minimum in 1959, rising again until 1962 as if there were natural fluctuations (Beven 1963). During this period the chaffinch seems to have declined over much of England (Parslow 1967–68). Since then numbers have increased to eight in 1965 and then declined to three by 1970, rising again to eight in 1972, and then falling again. Thus the waxing and waning of the population has continued with at least three peaks in 28 years. These changes were not reflected in the scrub chaffinch population between 1964 and 1973, but the BTO Common Bird Census index does suggest somewhat similar fluctuations in woodland between 1964 and 1972 with a minimum in 1970. The population changes (Fig. 6) do not seem to correspond with those of the dunnock.

Most chaffinches enter the wood in April and leave in July, very few remaining in autumn (Beven 1953). The average numbers counted each month over the twelve years 1949 to 1955 and 1964 to 1968 were: Jan. 1, Feb. 0, March 2, April 8, May 9, June 15, July 4, Aug. 2, Sept. 3, Oct. 3, Nov. 1, and Dec. 1. However in the five years 1964 to 1968 none were recorded in January, February, November and December. The few found in these months in earlier years were probably attracted by seed put down at that time for pheasants.

General Conclusions and Future Conservation Management

Apart from a few striking fluctuations, the census results emphasise the relative stability of woodland breeding bird populations and confirm the long-felt impression of naturalists that bird numbers change little in a stable environment (Lack 1954). Some changes such as those of wren and robin were temporary and seem to be largely related to climatic conditions. On the other hand the decline of the willow warbler and perhaps also the disappearance of the whitethroat seem to be related to gradual changes in the environment, an increase in density of the wood, and ageing of the trees since selective felling was discontinued. Increased maturity of the trees in the last 10 or 15 years may have allowed larger tit populations by providing more nest holes, and a similar factor may have encouraged the nesting of starlings. The cause of the overall decline of the chaffinch is unknown.

As the density of the oak-wood has increased over the years the number of species of warbler has decreased from 6 to 3, willow warblers, whitethroats and lesser whitethroats having virtually gone (they seem to prefer a rather more open woodland), and garden warblers have declined in numbers. In fact, for the sake of both wild life conservation and of amenity it seems desirable to interfere with natural succession and to prevent the formation of uniform climax oak-wood over too large an area. Management should perhaps consist chiefly of maintaining or opening up woodland paths and rides to expose to sunlight broad strips of grassy ride bordered with brambles, wild flowers and shrubs which can then flower and fruit more successfully than in the dense shade of the woods. These glades are biologically more valuable than tracks with overhanging vegetation (Nature Conservancy 1970). To maintain these rides the scrub needs to be cut periodically between October and March, the blade of the rotary cutter being set at four inches (10 cm) above the ground. Each side might be cut every two or three years and not all rides in the same year. The grass may need cutting; if so, the swipings should perhaps be removed to avoid a nitrogen build-up or "hayfield" effect. The felling of some trees here and there might be beneficial, perhaps even making small clearings, but a reasonable number of large trees should be left to reach their prime and decay, as the later stages of oak-wood succession are richer in insects than the earlier stages (Nature Conservancy 1970).

Scientific Names

Mandarin *Aix galericulata* (L.), sparrowhawk *Accipiter nisus* (L.), pheasant *Phasianus colchicus* L., woodcock *Scolopax rusticola* L., stock dove *Columba oenas* L., woodpigeon *C. palumbus* L., turtle dove *Streptopelia turtur* (L.), cuckoo *Cuculus canorus* L., tawny owl *Strix aluco* L., green woodpecker *Picus viridis* L., great spotted woodpecker *Dendrocopos major* (L.), lesser spotted woodpecker *D. minor* (L.), carrion crow *Corvus corone* L., magpie *Pica pica* (L.), jay *Garrulus glandarius* (L.), great tit *Parus major* L., blue tit *P. coeruleus* L., coal tit *P. ater* L., marsh tit *P. palustris* L., willow tit *P. montanus* von Baldenstein, long-tailed tit *Aegithalos caudatus* (L.), nuthatch *Sitta europaea* L., treecreeper *Certhia familiaris* L., wren *Troglodytes troglodytes* (L.), mistle thrush *Turdus viscivorus* L., song thrush *T. philomelos* Brehm, blackbird *T. merula* L., nightingale *Luscinia megarhynchos* Brehm, robin *Erithacus rubecula* (L.), blackcap *Sylvia atricapilla* (L.), garden warbler *S. borin* (Boddaert), whitethroat *S. communis* Latham, lesser whitethroat *S. curruca* (L.), willow warbler *Phylloscopus trochilus* (L.), chiffchaff *P. collybita* (Vieillot), goldcrest *Regulus regulus* (L.), spotted flycatcher *Muscicapa striata* (Pallas), dunnock *Prunella modularis* (L.), starling *Sturnus vulgaris* L., hawfinch *Coccothraustes coccothraustes* (L.), greenfinch *Carduelis chloris* (L.), redpoll *Acanthis flammea* (L.), bullfinch *Pyrrhula pyrrhula* (L.), chaffinch *Fringilla coelebs* L.

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Conservation Report 1975

by ANNE MCCORD*

The activities of the London Nature Conservation Committee continued to flourish during 1975. The committee met on six occasions during the year under the chairmanship of Mrs Pearl Small. The committee consist of members from many areas of London with a wide range of interests as well as representatives from the Herts. and Middlesex, Essex, Kent, Surrey, and Berks., Bucks. and Oxon County Trusts. There are also representatives from the Croydon Natural History and Scientific Society, Orpington Field Club and the Selborne Society.

The conservation problems within the area covered by the London Natural History Society are complex and varied and include areas as large as Hampstead Heath or as small as a pond on Clapham Common. It is impossible, in one report, to describe the whole range of conservation questions and problems dealt with in the course of a year, but several examples might help to illustrate the nature of the Committee's work.

A scheme to extract gravels from Staines Moor (a metropolitan common and SSSI), and a planning application which would have destroyed an interesting marsh and woodland site near Bromley, were both opposed. The objections were successful in both cases and the planning permission was refused. At present the committee is considering the problems caused by a new orienteering course which has been laid through several vulnerable areas on Hampstead Heath and the three alternative routes suggested by the Department of the Environment for the M25 through Kent. When dealing with these matters, the committee works in association with the local trusts, natural history societies and other societies which have a direct interest and responsibility in conservation.

Committee members frequently visit threatened sites to report on special features of natural history which may strengthen the case for conservation. The committee is often consulted by local authorities and others about conservation problems and is able to give the necessary advice. Other forms of action include letters and reports stating the case for conservation to the authority responsible for the threatened site.

Some of the sites considered at meetings are rather special to the London conurbation. Within central London there are a large number of cemeteries varying from small local plots to the Victorian magnificance of the mausoleums in Highgate Old Cemetery. Many of these cemeteries are now abandoned, neglected and subject to vandalism, but in many parts of London they are the only areas of open space which are suitable sites for nature reserves, provided they are properly managed. At present the committee is fully involved in consultations with the appropriate authorities over future plans for Abney Park Cemetery in north-east London and Highgate Cemetery.

As a result of the concentration of population, the problems of housing and increasing road building, there are always sites under new pressures. The committee cannot keep track of every threat so we must ask you for help. Every member of the London Natural History Society can act as the eyes and ears of the Conservation Committee. If you know of any area, large or small, under threat, please let us know. A letter or telephone call to the Secretary, Anne McCord, may help to conserve another small part of London.

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Botanical Records for 1975

by R. M. Burton*

This compilation is intended as a continuation of those produced for over thirty years by J. E. Lousley, whose obituary notice appears elsewhere in this issue. He had evidently assembled the records which be intended to put into his report for 1975, and was at his desk working on them when he died. I have endeavoured to include all the records he would have done, and have added a few which he did not have to hand. I have also, I think, unwittingly imitated his prose style. This is an example of the powerful influence exercised by his exemplary handling of botanical and society matters. He never laid down the law about how a plant should be pressed, a photograph taken or a meeting conducted; but it was always evident that his way was the best way.

As in his recent reports, localities include a tetrad reference, e.g. (57T84), as used by the Society's plant mapping scheme. These references are based on the national grid, and are fully explained by Sandford in *Lond. Nat.* **51:** 20–21 (1972). The plant nomenclature is based on the *List of British Vascular Plants* (1958), prepared by J. E. Dandy, and the authors' names of species in that list are omitted.

V.C. 16, West Kent

The north-eastern sector of our part of Kent continues to receive very close attention from J. R. Palmer. His discoveries connected with waste from a factory processing soya beans were mentioned last year by Mr Lousley and from his long and excellently detailed list it is possible to repeat only a selection of the many other exciting records. On shingle by the Thames at Greenhithe (57T84) he found *Cochlearia officinalis*, the first certain record of this scurvy-grass anywhere in West Kent; a voucher specimen of this is held at the Maidstone Museum. Also new for our part of the tidal riverside are *Parapholis incurva* and *Agropyron* x *oliveri*, the hybrid of the common and sea couch grasses, near Stone Marshes (57T64). In chalkpits Mr Palmer found new localities for *Epipactis phyllanthes* and *Orobanche hederae*, the former between Stone and Greenhithe (57T64), about one km from the other colony known in the area, the latter, represented by about 20 plants, east of Greenhithe church (57T84). The discovery in a gravel-pit at Green Street Green (57T60) of quantities of *Aster tripolium*, *Puccinellia fasciculata*, *P. pseudodistans*, *Spergularia marina* and *S. media* implies the dumping of mud from a salt-marsh. At a joint meeting of this society and the Kent Field Club he led us to a large colony of *Bromus madritensis* at Swanscombe (67T04) previously overlooked even by himself, although it must have been established for some years. In an old railway cutting (56T88) near Longfield he found at least five plants of *Prunus mahaleb* L. of different sizes, enough to indicate that the St Lucie Cherry is becoming naturalised. Mr Palmer also reports seedlings of *Euonymus japonicus* Thunb. from a chalkpit (57T84) east of Greenhithe and elsewhere, a surprising occurrence as this favourite hedging plant is rarely seen to set fruit.

Further thorough searches of the area south and east of Orpington have been undertaken by members of the Orpington Field Club, principally by Miss H. Proctor and Mrs J. Pitt. In a field (46T64) near her home Mrs Pitt found *Stachys arvensis*, which has become a very rare plant near London in recent years. This record was confirmed by Mr Lousley, and also present were both our species of *Kickxia*, which appear to have been well suited by the climatic

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* Sparepenny Cottage, Sparepenny Lane, Eynsford, Kent.

conditions of 1975. *Carex pseudocyperus*, known to the club in a damp corner of Roundabout Wood (46T26) for several years, is extremely scarce in our part of Kent. *Erodium moschatum* was discovered on a sandy bank outside a school in Poverest Road (46T66); this was perhaps introduced when an orchard, now disappeared, was established on the site. Our only other record of this stork's-bill is from an old orchard still standing.

A couple of hours in the streets of Deptford, not the most interesting of places to the twentieth-century botanist, produced a few unexpected plants for myself: single specimens of *Veronica catenata* near the Thames, *Verbena officinalis* in a lawn (both 37T68), *Sisymbrium irio* in an empty corner site (37T66) and *Bromus japonicus* Thunb. on the pavement of Grove Road (37T68). The last, named for me by Dr A. Melderis, is our first record of this casual species since 1928; my plant was perhaps introduced via a nearby timber-yard, though other origins are possible. Near Lullingstone Castle (56T24) I found *Galanthus nivalis* much more convincingly naturalised than anywhere else where I have seen it in Kent. Near the top of the river-wall in the Thamesmead area (48T60) I found an isolated colony of *Echium vulgare*, reported independently by J. Cotton.

In and near an old orchard (46T04) near Nash R. Clarke and C. T. Prime found a well established colony of the Dalmatian *Crocus tomasinianus* Herb. This species has the reputation of seeding itself in gardens, and is much more general in bulb-merchants' catalogues than the alpine *C. purpureus* which is more commonly reported as an escape. *C. tomasinianus* has narrower (3 mm) leaves and is glabrous in the throat of the perianth.

V.C. 17, Surrey

Mr Lousley's own excursions in his home county in 1975 produced one outstanding record, an abundance of *Potamogeton pusillus* in shallow water (06T26) near Thorpe. This was with B. R. Radcliffe, for whom he identified *Atriplex hortensis* gathered near Cuddington Golf-course (26T40). Mr Radcliffe, in attempting to re-locate for the society's plant mapping scheme as many as possible of the rarer species last recorded before 1965 and so needing to be confirmed, has succeeded in finding, amongst others, one large plant of *Osmunda* on Esher Common (16T22; previously recorded in 1947); *Hordelymus*, still locally plentiful in a wood (25T66) near Chipstead, and best of all, *Pilularia* in a locality of which perhaps no more should be said than that it is less than two km from where Mr Lousley discovered it in 1927. By the time this report is published, it should be possible to relate these finds to the history of the species in Surrey generally, using the *Flora of Surrey*, the preparation of which was Mr Lousley's last major work.

Mr Radcliffe has also produced a number of interesting new records of which space permits mention of only a few. He found *Aster tripolium* growing out of the concreted river-wall at Battersea (27T66). A single plant of *Anthriscus caucalis* on Laleham Burway Golf-course (06T48) is our first in Surrey since 1943. *Cannabis sativa* L. appears frequently on rubbish tips, but the 15 plants he found were at the margin of Walton Mere (25T24); he suggests that they may have sprung from spilt hemp seed intended for ground bait by anglers. Over a hundred seedlings of Lawson's cypress, *Chamaecyparis lawsoniana* (Murr.) Parl., on wet clay at Arbrook Common (16T42) indicate the fertility of this commonly grown species. That *Pseudotsuga menziesii* can also become naturalised is shown by the presence of many seedlings and saplings above Black Pond, Esher Common (16T22). *Bunias orientalis* continues to appear in new places in our area; some of the plants Mr Radcliffe found at Hogden Bottom (25T44) had been nibbled close to the ground by cattle, but identification was possible from the path-side plants which the animals had not been able to reach.

The greatest surprise in our 1975 Surrey records was Miss M. E. Young's discovery in Richmond Park (17T82), never a neglected area botanically, of an isolated population of *Viola palustris*. This is even more remarkable than her discovery in 1974 of *Moenchia erecta* in the same area. R. Clarke, who had previously produced our first record of *Cephalanthera longifolia*, now comes up with another report of this rare orchid, represented in this case by a single plant found in the extreme east of Surrey under subclimax hawthorn. W. A. Vickers found a single plant of *Dipsacus pilosus* by the River Mole (15T64) south of Leatherhead; the small teasel is still found fairly easily in the west of our area on the Bucks./Middlesex border, but had apparently not been seen in this Surrey locality for many years.

A rose I gathered near Boulthurst Farm (45T00) south-east of Limpsfield turns out to be our first post-war record of *Rosa obtusifolia;* the plant it came from was the sole survivor of a grubbed-out hedge. A roadside nearby produced three plants of *Angelica archangelica* scattered along a ditch, and a bird-sown specimen of the shrub known in horticulture as *Ribes aureum*, which, Mr Lousley pointed out to me the day before he died, is correctly called *R. odoratum* Wendl.

V.C. 18, South Essex

The outstanding record from our part of Essex is of a plant very close to the Middlesex border, which many of our members have already seen on excursions led by B. Wurzell at Walthamstow Reservoirs (38T48), but pardonably failed to identify, as *Rorippa austriaca* x *sylvestris*, a hybrid new to the British list. This was determined by B. Jonsell, the Swedish monographer of the genus, and Mr Wurzell is to be congratulated on seeing through to a successful conclusion the story of a plant which puzzled even Mr Lousley.

Our meeting on 7 June, led by K. J. Adams, visited old chalkpits in the Grays area. The noteworthy feature of Warren Farm Pit (57T88) was an abundance of *Pyrola rotundifolia*. It was accompanied by *Hieracium lepidulum*, determined subsequently by C. West. A water-crowfoot in another part of this pit was identified by common consent as *Ranunculus baudotii*. Mill Wood House Pit (also 57T88) produced an assortment of plants, having sand at the top, chalk at the bottom, and a small amount of dumped soil on the way down. This most probably originated near the tidal Thames, accounting for the presence of *Aster tripolium* and a dock identified *in situ* by Mr Lousley as *Rumex cristatus*. The sandy ground produced *Lathyrus nissolia*, *Orobanche minor* and a sizeable patch of *Trifolium striatum;* the latter was a surprise to Dr Adams, being quite unknown from this part of Essex hitherto, although known from a number of localities nearby in Kent.

V.C. 20, Hertfordshire

At our meeting on 27 September, C. G. Hanson pointed out a length of bank along a re-made road (32T02) near Hertingfordbury where *Chenopodium hybridum* and *Datura stramonium* were both abundant. Not far away, above the A414, a white-flowered mullein was a good match for *Verbascum phlomoides*, and is presumably the var. *albiflorum* (Rouy) Wilmott of that species; the corollas that I collected turned to the normal yellow in the press.

V.C. 21, Middlesex

D. H. Kent visited a normally inaccessible part of the Regent's Canal (38T60) where he found *Oenanthe crocata*, *Lycopus europaeus*, *Cheiranthus cheiri* and

Sedum album well established on the stonework, a large colony of *Foeniculum officinale* nearby and *Myriophyllum spicatum*, *Zannichellia*, *Elodea canadensis*, *Potamogeton crispus*, *P. lucens* and *P. natans* in the water. At Staines (07T20) Mr Kent found a colony of 30 or more plants of *Chrysanthemum segetum* on a building site in the centre of the town. He has also passed on to us a note of the discovery by P. Cribb of two orchids, *Dactylorhiza fuchsii* and *D. praetermissa*, in a gravel-pit at Kempton Park (17T00).

In Inner London, Miss R. M. Haddon had been demonstrating the remarkable variety of plants to be found in W1. Many are apt to get weeded away before they reach maturity, but there is no doubt about the identity of those selected for mention here. *Digitaria sanguinalis* near Marylebone (28T80) was determined by C. E. Hubbard; this, like *Torilis nodosa* in Bryanston Square (28T60), probably came up from seed intended as bird food. *Solanum capsicastrum* (det. E. J. Clement) on a doorstep in Fitzhardinge Street (28T80) could have been self-sown from a window-box specimen of the winter cherry. *Montia fontana* and *Ranunculus flammula* as weeds in Paddington Street Gardens (28T80) would have come in with soil from some wetter part of the country. But what could be the origin of the solitary *Scrophularia aquatica* she found on the dry bare ground of a building site in Park Crescent Gardens (28T82)?

V.C. 24, Buckinghamshire

J. Rogerson found the first known *Alchemilla vestita* in our small part of Bucks. This species of lady's-mantle is rare in south-east England, but Mr Rogerson's locality (08T08) is only some three km from the only Middlesex station for the plant.

A Review of the Macrolepidoptera of the London Area for 1974 and 1975

by C. G. M. de Worms*

This is the eighth biennial review of the macrolepidoptera of the London Area since 1961. It follows that for 1972 and 1973 which appeared in *Lond. Nat.* **53**: 86–99 (1974). The general format is on similar lines to that of the earlier reviews, and fortunately the London region has not been materially affected by the drastic changes in county boundaries which took place in April 1974. Those of the Watsonian vice-counties are still being used for the purpose of this paper and for many others on various aspects of the natural history of the British Isles.

An important publication in April 1975 was *A Guide to the Butterflies and Larger Moths of Essex* produced under the auspices of the Essex Naturalists' Trust by a panel of local experts. The records cover parts of the eastern area which embraces vice-counties 18 and 19 and includes portions of Epping Forest. This is a valuable addition to our knowledge of the macrolepidoptera of this famous locality.

The weather always plays an important part each season in influencing the appearances and numbers of our butterflies and moths, and regarding the two years under review they were most dissimilar in this field. The early winter of 1974 was again fairly mild with a reasonably congenial spring, especially in April and May, making it a rather precocious one for the emergence of Lepidoptera. The summer was varied with a wet period in late June and again for most of September, with a paucity of migrant species. As a contrast 1975 opened with one of the mildest periods for the start of any recent year, with insects appearing and vegetation in flower several weeks ahead of normal. But the season received a rude shock and setback in March with heavy snow during the last few days and an ensuing chilly spring which lasted till the first days of June, when a very warm spell began and continued with a short break in July, till the start of September. In fact the summer was one of the hottest of the century with the shade temperature reaching over 32°C (90°F) for five days in the first week in August.

Before starting to give a general account of the more outstanding observations and captures during the two years, I would like first to thank all the collectors living in the Area and members of the public who have most kindly once more sent me their records and comprehensive lists. Though 1974 and 1975 may not have been so spectacular as 1972 and 1973 as regards newcomers to the London region, nevertheless there are quite a lot of interesting sightings, well up to the usual standard.

Beginning with the butterflies, the most remarkable one observed in the Area during the two years was that of a milkweed or monarch *Danaus plexippus* L.† An example of this magnificent insect with a wing span of nearly 12·5 cm (5 inches) was seen settled on some flowers in a garden in Westhorne Avenue, Eltham, on 15 September 1974. Its captor, Mr Alan Palmer, most kindly presented it to the Natural History Museum. Its occurrence in the Area is of great interest, as there have only been a handful of other specimens and their possible origin has always been open to much speculation. The butterfly is one of the world's greatest migrants with its largest concentration in North

* Three Oaks, Shore's Road, Woking, Surrey.

† Brackets are omitted from authors' names in accordance with current practice in this group.

America and the Canary Islands. The latter region is thought to be the main source of those reaching our shores, since its main foodplant, the milkweed, is not native in Europe.

Another even more startling capture about the same date was that of an African lycaenid (blue), also in a garden, at Haliburton Road in Twickenham. This was a female of the brown playboy *Virachola antalus* Hopffer on 17 September 1974. The fortunate captor who spotted it settled on an ice-plant *Sedum spectabile* was Mr Tombs who also generously handed it over to the experts at the Natural History Museum after they had identified it for him. Here it was kept alive for a little time in the hope it would oblige with ova, but it eventually died without producing any. Naturally there was even more speculation on how an insect whose home is in southern and tropical Africa could have appeared in a garden on the outskirts of the metropolis. There can be little doubt that the chrysalis must have been imported with some produce from those regions and somehow found its way to the Twickenham district where the female in question hatched out. There would appear to be no question of migration in this instance.

Turning now to the more homely side of our local butterflies, their appearance in the centre of the metropolis is always of special note. During that extremely hot first week of August 1975 Mr Michael Chalmers-Hunt saw a holly blue *Celastrina argiolus* L. flying down a street just off Blackfriars Station. The small white *Pieris rapae* L. was also numerous about that period in several parts of central London. It is always pleasant to hear of relatively scarce species penetrating the Area. Miss Kate Springett reports seeing a white admiral *Limenitis camilla* L. feeding on brambles at Highgate Ponds on 15 July 1975. That charming little butterfly the white-letter hairstreak *Strymonidia w-album* Knoch is always a delight to see. It was reported from Downe, Kent, during August 1975 by Mr Chalmers-Hunt and also again from the Thorpe area in Surrey by Mr Peter Baker in 1975. Mr Ronald Kettle also records quite a number of butterfly species during 1974 from Wimbledon Common, a veritable sanctuary for these insects. During that summer he noted there the holly blue, the speckled wood *Pararge aegeria* L., the comma *Polygonia c-album* L., the orange-tip *Anthocharis cardamines* L. and the large and small skippers *Ochlodes venata* Br. & Grey and *Thymelicus sylvestris* Poda, also the small copper *Heodes phlaeas* L. in Richmond Park in October of that year.

As regards the moths, though there have apparently been no additional new species for the Area during 1974 and 1975, one most important insect has come to light for the previous biennial period making the seventh for 1972–73. This was the breeding out in 1972 from a larva found in 1971 at Nazeing in Essex of the very rare scarce wormwood shark **Cucullia artemisiae** Hufn. The fortunate collector was Mr J. Reid who showed it at the annual exhibition of the British Entomological and Natural History Society in November 1974.

As usual the record of captures in the moth-trap run in the garden of Buckingham Palace by Dr J. D. Bradley for the seventeenth year is always of special interest with several unexpected species. The most remarkable was the tiny geometer the maple pug *Eupithecia inturbata* Hübn., in August 1975, which has only been previously recorded on the Kent boundary of the Area and in Essex. The larvae seem to feed exclusively on the flowers of maples. These apparently occur in the grounds of the palace, though it is possible the larvae of this local insect may have also an alternative pabulum on the flowers of sycamore. At any rate the occurrence of this small moth, identified by the authorities at the Natural History Museum, is a most unexpected species to find in central London and it will be interesting to see if it recurs in this unlikely habitat. Another species of note to reappear in the palace garden in 1975 was the brown scallop *Philereme vetulata* Schiff., exclusively a buckthorn feeder. This bushy plant is not normally found in the centre of the metropolis. For

1974 the most notable record for the palace trap was another small geometer, the milfoil pug *Eupithecia millefoliata* Rössler, which has only found its way quite recently into the Area.

Another notable record during 1975 was a large female bedstraw hawk *Hyles gallii* Rott. which graced the trap of Mr E. Wild at Selsdon on 14 August (*Ent. Record* **87**: 278.) This grand species virtually bypassed the Area in the great immigration of 1973 though one was taken on the fringe at Thorpe that year. On 27 October 1975, Mr Wild also took at Selsdon a specimen of Blair's pinion *Lithophane leautieri* Boisd., first recorded for the Area in 1972, which evidently indicates a steady spread like several other migrants which first appeared in the 1950s. In spite of the marvellous summer of 1975 there does not seem much news of some of the more frequent migrant moths, in particular the death's head *Acherontia atropos* L. and the convolvulus hawks *Herse convolvuli* L. A prevalent spring moth among birch which is somewhat unaccountably scarce in the Area is the scarce prominent *Odontosia carmelita* Esp. Mr R. Chatelain obtained a specimen at light on 18 May 1975 on the eastern boundary of the Area at Farningham, Kent. Larvae of the rare little maple pug *Eupithecia inturbata* Hübn. were found by him in the same region later that month.

As already referred to, the production of the Essex list of Lepidoptera has brought to light several most interesting records for that part of v.c.18 which is embraced by the Area. Among these is an example of the grey swordgrass *Xylena exsoleta* L. of which there are very few records. The insect in question was taken in the autumn of 1974 in Epping Forest and reported to the Field Centre there by Mr N. Endacott. Another fine species, from Coxtie Green, was the great brocade *Eurois occulta* L., taken in July 1973 by Mr P. Wanstall. This noctuid, normally occurring in Scotland, occasionally visits our southern counties as a migrant. In the same locality as the last record Mr Wanstall also took the dotted rustic *Rhyacia simulans* Hufn. in July 1974, apparently only the fifth record of this scarce moth for the Area. Again at Coxtie Green, in the autumn of 1972, he noted the feathered ranunculus *Eumichtis lichenea* Hübn., a coastal insect and newcomer to South Essex. On 16 June 1974 Mr R. R. Cook recorded the white-banded carpet *Euphyia luctuata* Schiff. from Hookend at Blackmore on the eastern boundary of the Area. This pretty geometer, which is common in Kent, has rarely crossed the Thames, but there is evidence that it was not introduced and it may well have become established. Thorndon Park, just south of Brentwood, figures a great deal in the records for this eastern part of the Area during 1974. It produced examples of a number of uncommon species which have been enumerated in a long and comprehensive list by Mr W. Coster, who has also sent in another list of records for 1974 at Bury Farm near Cranham. These two lists will be dealt with in more detail in the county analyses below. A few notable species from Thorndon Park include the maple prominent *Lophopteryx cucullina* Schiff., seldom a common moth anywhere, also Webb's wainscot *Nonagria sparganii* Esp., another local marshland insect. Mr Coster mentions too the prevalence in both localities during 1974 of the stout dart *Spaelotis ravida* Schiff. and of the pale shining brown *Polia nitens* Haw. The former species is unpredictable in its appearance and may well be a partial migrant. There were further discoveries of the sloe pug *Chloroclystis chloerata* Mab. in parts of South Essex. This little moth only came to literary light in 1971 and in 1972 was found to be quite abundant in parts of the Area. Another small insect which seems steadily to be extending its range is the rosy marbled *Hapalotis venustula* Hübn., which appeared in July 1974 at Totteridge in the trap of Mr I. Lorimer. It has continued to be fairly common at Bexley according to Mr B. K. West, whilst the waved black *Parascotia fuliginaria* L. seems to have become well established in that region. The least carpet *Sterrha vulpinaria* H.-S. appears to be spreading rapidly, having been recorded at Wimbledon in 1975 by Sir John Dacie. Sir John also took the brown tail *Euproctis chrysorrhaea* L., which may be the first reappearance of this pest in this region since the first years of the present century when larvae were found in numbers near Kingston Hill. Another small noctuid which has been found to be fairly prevalent in the Area is the rufous minor *Procus versicolor* Borkh., which Mr I. Lorimer has determined as occurring regularly at Totteridge in 1974 and 1975. Its reliable identification can only be carried out by viewing the genitalia. He also obtained there in 1975 a remarkable melanic specimen of the double-lobed *Apamea ophiogramma* Esp., apparently an unnamed form. In 1975 at Wormley, the Rev. D. Agassiz took a black example of the dun bar *Cosmia trapezina* L. Mr K. Evans once more reports the finding of the alder kitten *Harpyia bicuspis* Borkh. on the Surrey boundary at Limpsfield Chart, while Mr P. J. Baker took in 1975 the beautiful snout *Bomolocha fontis* Thunb. near Chertsey. Its only previous record from the Area was in the Limpsfield district where bilberry, its foodplant, is present. The starwort shark *Cucullia asteris* Schiff. was another surprise visitor to this part of Surrey in June 1974. The bordered grey *Selidosema brunnearia* Vill., which is fairly common on heaths just outside the Area boundary, came to Mr Baker's light near Thorpe in the form of a female on 13 August 1974. It is apparently a long time since this attractive geometer has penetrated into the Area. The general consensus of opinion is that moths were less numerous at light in 1975 than in 1974 in the Area in spite of the remarkable summer of 1975.

Coming now to the analysis of the records from the vice-county regions, as usual an asterisk (*) indicates a species not previously reported for the region under review.

Starting with INNER LONDON, which often has some of the most interesting records, those from Buckingham Palace take pride of place, though there does not seem to have been quite so many as on previous occasions. In the general review emphasis has already been made on the appearance in 1975 of the maple pug*, a remarkable occurrence. The reappearance of the brown scallop, a buckthorn feeder, was noteworthy for 1975, which also saw there that small noctuid the lesser-spotted pinion *Cosmia affinis* L., an elm feeder, with another small geometer the small rivulet *Perizoma alchemillata* L., a larval feeder in hemp nettle. Other geometers for 1975 included the common emerald *Hemithea strigata* Müll., the foxglove pug *Eupithecia pulchellata* Steph., and the V-moth *Itame wauaria* L. In 1974 the least yellow underwing *Euschesis interjecta* Hübn. was an unexpected visitor to the trap in the palace garden, while the broad-bordered yellow underwing *Lampra fimbriata* Schreber, this most handsome of the noctuids, appeared in unusual numbers. Among the butterflies seen in the palace grounds during both years were the comma and wall brown *Pararge megera* L. as well as plenty of green-veined whites *Pieris napi* L. In fact butterflies in any part of central London are always worth recording and the holly blue near Blackfriars in August 1975, already referred to, was particularly interesting. The small white was very prevalent in many parts of the central Area and there were a lot flying in the grounds at Chelsea at the time of the Flower Show at the end of May 1975.

Though MIDDLESEX (v.c. 21) no longer officially exists, it does so for the purpose of this review in its Watsonian designation, although few records are forthcoming for the two years. The extraordinary appearance of the African lycaenid, the brown playboy, in Twickenham on 17 September 1974 was the most notable capture. The sighting of a white admiral on 15 July 1975 at Highgate Ponds was also of especial interest. The only moths recorded for Middlesex come from Mr Barry Goater who took at Wall Hall Estate, Aldenham, on 19 May 1975 both normal and melanic forms of the larch pug *Eupithecia lariciata* Freyer, also quite a lot of the dwarf pug *Eupithecia tantillaria* Boisd. in the same locality on that date. From a garden in Enfield the Rev. D. Agassiz reports the finding of many pupa cases of the small red-belted clear wing *Aegeria myopaeformis* Borkh. observed protruding from an apple tree by Mr Robert Dyke in June 1975.

For HERTS (v.c. 20) the main records come from Mr Ian Lorimer from observations made at his mercury-vapour moth-trap in his garden at Totteridge. Although 1974 did not provide as many outstanding insects as in some other seasons, several are worth recording. In late March of that year he took a hibernated tawny pinion *Lithophane semibrunnea* Haw., never seen in any numbers and more usually as single specimens. It is a scarce insect and his first. Another newcomer was the rosy marbled*. This little noctuid seems to be steadily spreading in the Area. The juniper pug* *Eupithecia sobrinata* Hübn. noted in late July, is yet another new record as also is the rufous minor*. The stout dart visited Mr Lorimer's trap in the middle of September 1974 as also did in mid-July, the blackneck *Lygephilia pastinum* Treits, which he had only seen there once before.

Mr Lorimer has not given a very long list for 1975, but his record of the pale lemon sallow* *Cirrhia ocellaris* Borkh. in October is noteworthy, since this species has apparently not been recorded for the vice-county. He mentions that the least yellow underwing *Euschesis interjecta* Hübn. was unusually plentiful in 1975. In early August he saw the slender brindle *Apamea scolopacina* Esp. after an interval of ten years. In mid-June to took Haworth's pug *Eupithecia haworthiata* Doubl., only once before recorded for Hertfordshire. The rufous minor reappeared, but his most outstanding capture was a melanic form of the double-lobed, apparently hitherto unnamed. Migrants during 1975 were scarce, though there was quite an influx of the silver-Y *Plusia gamma* L. during late summer, together with a few pearly underwings *Peridroma porphyrea* Schiff. The small red-belted clearwing was common in apple trees in his garden in 1975. In Wormley Wood in July 1975 the Rev. D. Agassiz took a remarkable melanic example of the dun bar *Cosmia trapezina* L.

From Bushey Mr Barry Goater records for 1975 the abundance of Freyer's pug *Eupithecia arceuthata* Frey., his first netted pug *Eupithecia venosata* Fab. in his garden, and also the blackneck *Lygephila pastinum* Treits on 16 July. Another newcomer was the lunar-spotted pinion *Cosmia pyralina* Schiff. on 3 August and his third white-spotted pinion *Cosmia diffinis* L. on the same date. Both these insects are suffering from the effects of the ravages of Dutch elm disease. Mr Goater also found a colony of the six-spot burnet *Zygaena filipendulae* L. in which the terminal spots on the forewings of many specimens were united.

For NORTH ESSEX (v.c.19), often without any records, this small region of the Area has the privilege of providing the only species new to it, although this is for the previous biennial period. As already mentioned Mr J. Reid found a shark moth larva feeding on *Artemisia vulgaris* at Nazeing on 4 September 1971. This produced an imago on 2 July 1974 of the extremely rare scarce wormwood shark of which there are possibly some half dozen British records, mostly in the last century. This may well be the first authentic specimen bred out in this country this century.

For SOUTH ESSEX (v.c. 18) there are a prolific number of records. The grey swordgrass in Epping Forest in the autumn of 1974 was indeed a rarity, while a dotted rustic* taken at Coxtie Green in July of that year by Mr P. Wanstall constituted only the fifth of this species for the Area. This locality also provided a single great brocade in July 1973 and the feathered ranunculus*. Another interesting arrival has been the waved black, also reported by Mr Wanstall 1975 with the bordered sallow *Pyrrhia umbra* Hufn. in 1975 and the beautiful carpet *Mesoleuca albicillata* L. in 1974. The finding of the white-banded carpet* at Hookend near Blackmore in 1974 was another addition, as was Vine's rustic* *Caradrina ambigua* Fab. taken at Coxtie Green in 1972 by Mr P. Wanstall.

Thorndon Park figures a great deal in the county list. It is just on the eastern boundary of the Area and a comprehensive list of its inhabitants in 1974, comprising 300 species of butterflies and moths, has been sent in by Mr W. Coster. The 20 kinds of butterfly do not present anything abnormal. Among the larger moths, however, the emperor *Saturnia pavonia* L. does not seem very prevalent in this part of England where the most unexpected insect on this list was the maple prominent*. This moth is seldom seen except on chalk where its foodplant flourishes. The small satin lutestring* *Tethea duplaris* L. is another species apparently not noted in this region before. The pale oak eggar *Trichiura crataegi* L. and the tiny round-winged muslin *Comacla senex* Hübn. were interesting records among the lasiocampids and arctiids respectively. Coming to the noctuids, the stout dart reappeared in 1974 as also did the pale shining brown. The slender brindle *Apamea scolopacina* Esp. is a local insect which is on the Thorndon Park list with the obscure wainscot *Leucania obsoleta* Hübn. The chamomile shark *Cucullia chamomillae* Schiff. and the deep-brown dart *Aporophyla lutulenta* Schiff. are both uncommon species for this region. Other noctuids included Webb's wainscot, the white-spotted pinion *Cosmia diffinis* L. the dotted fanfoot *Macrochilo cribrumalis* Hübn. and the beautiful golden-Y *Plusia pulchrina* Haw.

Among many geometers in the park were apparently three new to the vice-county. These were the large rivulet* *Perizoma affinitata* Steph., which feeds in red campion, the barred rivulet* *Perizoma bifaciata* Haw., of which the foodplant is red bartsia and the sloe pug* which was only added to the British list in 1971 and is being found to exist in many parts of southern England. A few other geometers are worthy of record. These comprise the large thorn *Ennomos autumnaria* Thunb., the lunar thorn *Selenia lunaria* Schiff., the lilac beauty *Apeira syringaria* L., the large seraphim *Lobophora halterata* Hufn., the scorched carpet *Ligdia adustata* Schiff. and the sloe carpet *Bapta distinctata* H.-S.

Mr Coster has also submitted another list of 120 species of moths recorded from Bury Farm, Cranham, in 1974. He mentions the abundance of the stout dart *Spaelotis ravida* Schiff. with an average of 10 a night in late summer and also of the pale shining brown with as many as 40 per night, a remarkable record. The dusky sallow *Eremobia ochroleuca* Schiff. rose to 20 a night in August, also the double-lobed with three or four nightly at this period. Among other species were the lappet *Gastropacha quercifolia* L., the brown-tail, the least yellow underwing, the blackneck and the bordered pug *Eupithecia succenturiata* L.

For 1975 Mr Coster has several important records, notably finding larvae of the tiny maple pug* from hedgerow maple in Thorndon Park, new to this part of Essex, though it has been taken in several other areas in the county. A number of imagines were bred out, some with melanic tendencies. Another notable addition was the finding of larvae in quantity of the milfoil pug* *Eupithecia millefoliata* Rössler feeding on dead yarrow heads on a railway bank near Hornchurch in October. This insect has been found to exist over a wide area in the county. In Hornchurch too he saw the least carpet *Sterrha vulpinaria* H.-S. in numbers with some 40 mullein waves* *Scopula promutata* Guen., a comparative newcomer. The dog's tooth *Hadena suasa* Schiff. was also numerous with the first crescent *Celaena leucostigma* Hübn. for this locality. For the Bury Farm list new additions in 1975 included the wormwood shark *Cucullia absinthii* L., the pale oak eggar *Trichiura crataegi* L. with 16 specimens in September, also Webb's wainscot *Nonagria sparganii* Esp. and a number of the large thorn and of the lunar thorn *Selenia lunaria* Schiff. Another rarity was the discovery of larvae of the pimpernel pug *Eupithecia pimpinellata* Hübn. near Thorndon Park on 27 September. A small colony of the brown argus

Aricia agestis Schiff. was also found there. Finally in Epping Forest on 28 May 1975 Mr Coster beat nine larvae of the scarce green silver-lines *Pseudoips bicolorana* Fuessl. with three of the purple hairstreak *Thecla quercus* L.

From the Essex list there are a number of additional insects of note taken in Thorndon Park by Mr P. C. Follett, mainly in 1973. In this year his most notable capture was a water ermine *Spilosoma urticae* Esp., a new region for it in the county. Other species of special interest were the round-winged muslin *Comacla senex* Hübn., the ruddy carpet *Euphyia rubidata* Schiff., the lead-coloured pug* *Eupithecia plumbeolata* Haw., the milfoil pug and the slender brindle. From the list too there is a scarce bordered straw *Heliothis armigera* Hübn. from Ongar on 14 October 1969, taken by Dr D. C. Twinn, and also a bordered straw* *Heliothis peltigera* Schiff. from Romford taken on 26 May 1966 by Mr R. R. Cook and new to the vice-county.

Mr K. W. Grimwood has submitted an interesting list from Ingrave covering both years. He recorded 249 species of macro-moths in 1975 as against 190 in 1974. In both years he had single specimens of the bordered white *Bupalus piniaria* L. which he had not seen before. Other rarities were the small yellow underwing *Panemeria tenebrata* Scop., the cream wave *Scopula lactata* Haw. and the mullein wave *Scopula promutata* Guen. Other species included the lesser satin lutestring *Tethea duplaris* L., the white satin *Leucoma salicis* L., the oak eggar *Lasiocampa quercus* L., the lappet *Gastropacha quercifolia* L., the rosy footman *Miltochrista miniata* Forst., the rosy minor *Procus literosa* Haw. very common in 1975, also the small elephant hawk *Deilephila porcellus* L. and the slender brindle, a rarity in that vicinity. Among other geometers were the grass emerald *Pseudopterna pruinata* Hufn. and the great emerald *Geometra papilionaria* L., both of which Mr Grimwood had only seen once previously. The small blood-vein *Scopula imitaria* Hübn., the large rivulet, the barred yellow *Cidaria fulvata* Forst. and the lunar thorn *Selenia lunaria* Schiff. were more geometers on his list. Butterflies too were especially numerous during the hot weather in 1975 with quite a number of red admirals *Vanessa atalanta* L. and painted ladies *Vanessa cardui* L. as well as commas.

As usual WEST KENT (v.c. 16) has provided quite a lot of interesting records. The most outstanding of these was the capture of the monarch at Eltham by Mr Palmer on 15 September 1974. The last sighting of this grand insect in this vice-county area was at West Wickham in August 1950.

During 1975 Mr M. Chalmers-Hunt saw the white-letter hairstreak at Downe on 15 August, also the comma together with the ringlet *Aphantopus hyperanthus* L., both at West Wickham, while larvae of the wormwood shark were common at Dartford in August.

Mr C. G. Bruce reports from Lee that he saw the four-spotted *Acontia luctuosa* Esp., both in June 1974 and July 1975 in three single examples. Of recent years this little noctuid has become increasingly scarce so that it is gratifying to hear of its reappearance. He also mentions two specimens of the barred rivulet *Perizoma bifaciata* Haw. on 30 July 1974 and 3 August 1975. The brown-tail, the lesser satin lutestring, the sallow kitten *Harpyia furcula* Clerck and the bordered beauty *Epione repandaria* Hufn. were all insects seldom seen at Lee and all noted in 1975.

For many years Mr B. K. West has sent in comprehensive lists for both seasons. He says 1974 was a very prolific year at Bexley. Both the triple-spotted clay *Amathes ditrapezium* Schiff. and the bordered gothic *Heliophobus reticulata* Vill. were newcomers to his trap. Both the rosy marbled and the waved black reappeared on several occasions. There were again plenty of larvae of the brown-tail on the outskirts of Dartford, while a batch of larvae of the emperor was found on Dartford Heath feeding on heather. In April the orange underwing *Archiearis parthenias* L. was common in Joyden's Wood where the gold swift *Hepialus hecta* L. was swarming in July. Other species worthy of note for 1974 were the double dart *Graphiphora augur* Fab., the gothic *Naenia typica* L., the rosy minor *Procus literosa* Haw., the blackneck *Lygephila pastinum* Treits., also the geometers the large twin-spot carpet *Xanthorhoe quadrifasciata* Clerck, the small yellow wave *Hydrelia flammeolaria* Hufn. and the lilac beauty.

In spite of the fine summer in 1975 Mr West says it was an inferior season for records. The varied coronet *Hadena compta* Schiff. was again in evidence, but there were only single specimens of the large nutmeg *Apamea infesta* Ochs. the olive *Zenobia subtusa* Schiff., the scarce green silver-lines, the mullein wave *Scopula promutata* Guen. and the blunt-angled peacock *Semiothisa notata* L.

Mr West mentions that the early moth *Theria rupicapraria* Denis & Schiff. and the dotted border *Erannis marginaria* Fab. were fully out on Dartford Heath on 28 December 1974 in that very mild winter. He also gives the proportions of the three forms of the peppered moth *Biston betularia* L. for both years: in 1974 of a total of 109 insects recorded, 8 (7%) were typical, 14 (13%) were f. *insularia*, the intermediate form, while no less than 87 (80%) were f. *carbonaria*, the melanic form, whereas for 1975 only 69 examples appeared of which 10% were typical, 22% were f. *insularia* and 68% f. *carbonaria*. This gives some idea of the fluctuations of these forms of this common moth.

Mr R. Chatelain has also sent some interesting records for Kent. Mention has been made of his scarce prominent from Farningham in May 1975 where he also obtained larvae of the maple pug. At Orpington in October 1974 larvae of the barred rivulet were abundant on red bartsia.

SURREY (v.c. 17) has as usual provided a large number of records, especially of butterflies. Mrs P. O. Dunkley of Tadworth has submitted a list of insects she observed during 1975 in various localities in each month. Probably her most noteworthy record is that of the little Duke of Burgundy fritillary *Hamearis lucina* L. at Burford Bridge, Box Hill in June, just on the southern boundary of the Area. This delightful species has grown markedly scarcer in Surrey in recent years and its reappearance in this locality is encouraging news. In the same month she saw the pearl-bordered fritillary *Clossiana euphrosyne* L., also at Box Hill. During July there were many chalk-hill blues *Lysandra coridon* Poda both at Headley and on Walton Downs and also the speckled wood and the small skipper.

During August 1975 Mrs Dunkley observed a white admiral in her garden at Tadworth which is a most interesting butterfly to see so near London. At Headley in September she noted the small copper.

Mr Ron Kettle reports a number of butterflies on Wimbledon Common in 1974. These include the speckled wood both in June and September. The small heath *Coenonympha pamphilus* L. was prevalent during the first half of June, with a comma and red admiral seen on 14 July, the latter being scarce in eastern England that year. The large skipper was noted on the common on 18 June and the small skipper in mid-July. Holly blues were seen in Wimbledon on 15 May and 20 July and a small copper in Richmond Park on 12 October.

Among the moths Mr E. Wild would appear to have obtained the two best prizes for 1975 at Selsdon where he took a female bedstraw hawk on 14 August and Blair's pinion* *Lithophane leautieri* Boisd. on 26 October. This latter is a new record for the vice-county.

Mr K. Evans reports the recurrence of the alder kitten *Harpyia bicuspis* Borkh. at Limpsfield Chart on 26 June 1974 on the south-eastern boundary of the Area, a notable record. At Addiscombe in June 1974 there was the re-appearance of the varied coronet *Hadena compta* Schiff., while the least carpet *Sterrha vulpinaria* H.-S. was prevalent both in 1974 and in 1975. The little geometrid, the yellow-barred brindle *Acasis viretata* Hübn. on 8 August 1974 was a new record for this locality where a vapourer *Orgyia antiqua* L. came to a mercury vapour trap on 20 July 1975: an unusual occurrence.

Mr P. Cordell reports some interesting captures near the southern boundary of the Area in the Redhill region. In April 1974 he beat a number of larvae of the sloe pug *Chloroclystis chloerata* Mab. near Nutfield, another new station for this species. In the following June in the same locality a specimen of the obscure wainscot *Leucania obsoleta* Hübn. came to light, where in August 1974 the small mottled willow *Laphigma exigua* Hübn. was recorded, one of the few examples of this migrant for that year.

In April 1975 he obtained the water carpet *Lampropteryx suffumata* Schiff. at Mickleham. An exceptional capture was that of the alder kitten *Harpyia bicuspis* Borkh. at Nutfield on 11 June 1975, and also the maple pug *Eupithecia inturbata* Hübn. there on 12 August of that year. This small geometer is seldom a common species and there are few records for the Area. Three other geometrid species of special interest were recorded by Mr A. Allen at Salfords just south of Redhill. These were the flame *Euphyia rubidata* Schiff. at the end of July, the bleached pug *Eupithecia expallidata* Doubleday in early August, while a notable capture was that of the black-streaked pug* *Eupithecia phoeniceata* Rambur on 28 August 1975. There are only two previous records of this little moth for the Area, both from Kent, so that this one is new to the vice-county. The species was originally discovered in Cornwall in 1959 and has steadily spread eastwards. The larvae feed on cypress.

Mr Bernard Skinner once more records the beating of many larvae of the sloe pug from sloe blossom on Mitcham Common in April 1974. He mentions that the supposed melanic form of this insect, reported from this spot in the review for 1972 and 1973 (*Lond. Nat.* **53:** 96 (1974)) on further inspection turned out to be melanics of its near relative the green pug *Chloroclystis rectangulata* L. of which the larva also sometimes feeds on sloe.

Mr Peter Baker has once more recorded some unexpected moths in his light-trap at Thorpe. One of the most interesting is that of the beautiful snout *Bomolocha fontis* Thunb., not known before in this district. This insect, which appeared on 7 July 1975, may have flown from the nearest bilberry, its food-plant, well over two miles away. Other rarities for this part of Surrey were the starwort shark on 16 June 1974 and the orange footman *Eilema sororcula* Hufn. on 13 July 1975. The wormwood shark turned up in mid-July 1975. This moth seems to have become scarcer in the London Area since its sudden incursion just after the last war and through the 1950s. The dusky sallow *Eremobia ochroleuca* Esp., with his first record on 8 August 1974, is not a species likely to be found just off the Bagshot Sand; it seems to be recently increasing its range. On 8 August 1974 a female bordered grey *Selidosema brunnearia* de Vill. graced his trap and eventually provided him with a bred series. This must have been a wanderer from one of the local commons which are several miles distant. In a similar way the southern wainscot *Leucania straminea* Treits. must have travelled in July 1975 from a local marsh, as it is hitherto unknown in this part of the Area, as also was the square-spot *Ectropis consonaria* Hübn., recorded on 24 May 1974. Apparently this insect is common in Windsor Forest several miles away. Another scarce species which appeared on 9 June 1975 was the lunar thorn *Selenia lunaria* Schiff. There seems to be very few records of the large marbled tortrix *Nycteola revayana* Scop. for Surrey. This variable little moth was apparently numerous at Mr Baker's trap during 1975.

Reference has already been made to the capture at Wimbledon by Professor Sir John Dacie of the brown-tail and of the small geometer, the least carpet, both taken in 1975. The latter species is new to this part of the Area. The reddish light arches *Apamea sublustris* Esp., an unexpected visitor, was seen in

July 1974. In April 1974 Sir John discovered that larvae of the new moth, the sloe pug, were plentiful on Wimbledon Common feeding on blackthorn blossom. This is the second locality in the area for this species, the other being Mitcham Common, and it may well be found to be widespread wherever there is a profusion of its foodplant.

Bookham Common has not figured in this review for quite a long time. On 4 July 1974 Mr K. J. Willmott spotted a dark butterfly skimming along a ride; when it settled on a bramble he noticed to his amazement that it was the all-black variety ab. *nigrina* of the white admiral, a very rare form which may not have been seen in the Area before (see *Lond. Nat.* **54:** 47 (1975). He was also concerned about the ravages of Dutch elm disease and its effect on the white-letter hairstreak, since the larvae feed on both the smooth-leaved elm *Ulmus carpinifolia* and the rough-leaved species *U. procera* as well as on wych elm *U. glabra*, its favourite pabulum. The butterfly was particularly plentiful in 1971 and 1972 on the common, but its numbers have fallen off markedly since then.

For the small area of BUCKS (v.c. 24) there appear to be no records for the period since Sir Eric Ansorge, who used to supply interesting lists from Chalfont St Peter, no longer runs a trap or collects in that vicinity.

To sum up, with no additional species for 1974 and 1975 the proportion of macrolepidoptera in the London Area to that for the whole of the British Isles remains somewhat stationary at 76 per cent.

Mammals in the London Area 1975

by K. A. J. Gold*

The trend towards increased interest in mammal recording, reported last year, has been maintained in 1975. One area for which no records have been received is the society's part of Buckinghamshire, so would members please submit information from this region.

The otter *Lutra lutra* and the mink *Mustela vison* have appeared in this year's observations after an absence of some two to three years.

Systematic List for 1975

The checklist numbers are from Corbet (1969).

INSECTIVORA

1. Hedgehog *Erinaceus europaeus* L.

An increase in all areas except Essex and Herts.; it appears to be flourishing in parts of Middx. and Surrey.

Essex. Barkingside; Chadwell Heath; Dagenham; Hornchurch; Loughton; Rush Green; Sewardstonebury.

Herts. Radlett.

Inner London. Hyde Park; Kensington Gardens.

Kent. Beckenham; Bexley (Blackfen); Bromley Common; Chislehurst; Dulwich; Eltham; Farnborough; Foots Cray; Orpington; Petts Wood; Ruxley; Wilmington.

Middx. Edmonton; Enfield; Harrow; Hatch End; Kenton; Kingsbury; Potters Bar; Southall; Stanmore; Twickenham.

Surrey. Coulsdon; Esher; Pebble Hill; Streatham; Sutton; Tadworth; Tattenham Corner; Walton Oaks; Wandsworth Common; Wimbledon.

2. Mole *Talpa europaea* L.

Not a well-recorded species, but the Middx. populations are firmly established and apparently flourishing.

Essex. Fiddlers Hamlet; Weald Park.

Herts. Brickett Wood; Cassiobury Park.

Kent. Petts Wood.

Middx. Bentley Priory; Harrow Weald Common; Osterley Park.

Surrey. Bookham Common; Woldingham.

3. Common shrew *Sorex araneus* L.

Essex. Fiddlers Hamlet; Havering-atte-Bower; Sewardstonebury.

Inner London. Regent's Park.

Kent. Farnborough; Pratts Bottom.

Middx. Staines Reservoir.

Surrey. Greater Bookham; Esher.

4. Pygmy shrew *Sorex minutus* L.

Surrey. Ashtead; Beddington Sewage Farm.

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* 21 Starch House Lane, Barkingside, Essex.

5. WATER-SHREW *Neomys fodiens* (Pennant)

KENT. Ruxley Gravel-pits.

CHIROPTERA

The policy of accepting only records of bats identified in the hand is continued, all observations this year therefore referring to bats spp.

ESSEX. Hornchurch; Rush Green.

INNER LONDON. Hyde Park; Kensington Gardens.

KENT. Beckenham; Orpington; Petts Wood.

MIDDX. Enfield; Kenton; Potters Bar.

SURREY. Ashtead; Coulsdon; Tadworth.

CARNIVORA

24. FOX *Vulpes vulpes* (L.)

Not only has the number of sites increased in 1975 but the sightings have also gone up considerably. The species appears to be flourishing in parts of Kent and Surrey in particular.

ESSEX. Aveley; Grays; Harold Hill; Scotch Common; South Weald.

KENT. Beckenham; Bexley; Blackheath; Chislehurst; Dulwich; Elmstead Woods; Eltham; Farnborough; Kidbrooke; Orpington; Petts Wood; Swanscombe Park; Thamesmead.

MIDDX. Cockfosters; Harrow; Moore Park; Palmer's Green; Perivale; Perry Oaks Sewage Farm; Pond Wood Nature Reserve; Wembley.

SURREY. Ashtead; Banstead; Bookham Common; Coulsdon; Esher; Putney Heath; Streatham; Sutton; Wandsworth Common; Wimbledon Common.

27. STOAT *Mustela erminea* L.

ESSEX. Cranham; Fiddlers Hamlet.

KENT. Dartford; Westerham.

MIDDX. Stockers Lake.

28. WEASEL *Mustela nivalis* L.

ESSEX. Abridge; Bumbles Green.

HERTS. Water End.

MIDDX. Bentley Priory; Pinner; Stanmore; Stockers Lake.

SURREY. Bookham Common; Banstead; Walton.

30. AMERICAN MINK *Mustela vison* Schreber

MIDDX. Stanmore.

31. BADGER *Meles meles* (L.)

There is little change in the overall number of sightings of this species; only one site is recorded as active.

ESSEX. South Weald.

KENT. Knockholt; Pratts Bottom.

SURREY. Addington; Headley Warren; Selsdon; Wimbledon Common; Woldingham.

32. OTTER *Lutra lutra* (L.)

MIDDX. Colne valley.

ARTIODACTYLA

All three species recorded in the usual places.

44. FALLOW DEER *Dama dama* (L.)

ESSEX. South Weald.

45. ROE-DEER *Caproelus capreolus* (L.)

SURREY. Ashtead; Bookham Common; Epsom Common; Walton Downs.

46/47. MUNTJAC *Muntiacus* spp.

MIDDX. Hampstead; Pond Wood Nature Reserve.

- DEER spp.

HERTS. Chiswell Green.

SURREY. Chipstead.

LAGOMORPHA

53. BROWN HARE *Lepus capensis* L.

ESSEX. Bury Wood; Grays; Ongar; West Essex Golf Course.

HERTS. Essenden.

KENT. Sundridge.

MIDDX. Copse Farm; Harrow.

SURREY. Bookham Common; Chipstead; Dawcombe; Walton Downs.

55. RABBIT *Oryctolagus cuniculus* (L.)

The pattern for this species remains much the same as in other years, it being plentiful in parts of Surrey, Kent, and Essex. The numbers in Hyde Park began to increase in 1975, were controlled, but have once more begun to rise. There were no records of myxomatosis in 1975.

ESSEX. Aveley; Barkingside; Bobbingworth; Chadwell Heath; Fairlop; Fiddlers Hamlet; Grays; Hainault Forest; Hooks Hall; Purfleet; Stanford Rivers.

HERTS. Colney Heath; Essendon; North Mymms; Ridge.

INNER LONDON. Hyde Park; Kensington Gardens; Regent's Park.

KENT. Brasted; Dartford; High Elms Golf Course; Kidbrooke; Lullingstone Park; Petts Wood; Pratts Bottom; Ruxley Gravel-pit; Slade Green; Thamesmead; Westerham.

MIDDX. Bentley Priory; Hampstead Heath; Perivale; Perry Oaks Sewage Farm; Pinner; Staines Reservoir; Stanmore.

SURREY. Bookham Common; Epsom Downs; Esher; Headley Heath; Richmond Park.

RODENTIA

57. GREY SQUIRREL *Sciurus carolinensis* Gmelin

As with the rabbit the pattern is similar to 1974.

ESSEX. Epping Forest; Hornchurch; Loughton; Magdalen Laver; Upminster; Weald Park.

HERTS. Bayford; Colney; North Mymms.

INNER LONDON. Hyde Park; Kensington Gardens; Regent's Park.

KENT. Beckenham; Bromley; Catford; Chislehurst; Dulwich; Elmstead Woods; Farnborough; Greenwich Park; High Elms; Kelsey Park; Kidbrooke; Locks Bottom; Lullingstone Woods; Petts Wood; Roundabout Wood.

MIDDX. Enfield; Harrow; Marble Hill Park; Osterley Park; Potters Bar.

SURREY. Ashtead; Bookham Common; Burgh Heath; Coulsdon; Esher; Richmond Park; South Norwood; Streatham; Sutton; Wimbledon.

61. HARVEST-MOUSE *Miromys minutus* (Pallas)

ESSEX. Fiddlers Hamlet.

MIDDX. Potters Bar.

SURREY. Bookham Common; Esher.

62. WOOD-MOUSE *Apodemus sylvaticus* (L.)

ESSEX. Hainault Forest; Sewardstonebury.

INNER LONDON. Regent's Park.

KENT. Orpington; Pratts Bottom.

MIDDX. Hampstead Heath; Pinner Park Farm.

SURREY. Esher; Richmond Park; Tadworth.

67. BANK-VOLE *Clethrionomys glareolus* (Schreber)

ESSEX. Stapleford Tawny.

KENT. Westerham.

SURREY. Esher; Great Bookham; Headley Heath; Richmond Park.

68. WATER-VOLE *Arvicola terrestris* (L.)

ESSEX. Berwick Pond; Fiddlers Hamlet.

HERTS. Cheshunt; Walthamstow Reservoir.

KENT. Thamesmead.

MIDDX. Stockers Lake.

SURREY. Esher; Godstone.

69. FIELD-VOLE *Microtus agrestis* (L.)

ESSEX. Sewardstonebury.

KENT. Farnborough; High Elms.

MIDDX. Hampstead Heath; Pinner Park Farm; Wembley.

SURREY. Bookham Common; Great Bookham; Esher.

- VOLE spp.

ESSEX. Hainault Recreation Field.

KENT. Kelsey Park.

My thanks go to the following people who have contributed the records contained in this report: T. Allen, E. F. Anderson, Dr G. Beven, R. Bosanquet, D. A. Boyd, R. Brand-Hardy, Miss J. M. Clarke, J. Cotton, J. B. Cresswell, J. R. Damon, Mrs R. Davies, J. Davidson, P. O. Dunkley, P. J. Edwards, O. B. J. French, Mrs J. E. Gaffney, P. Gann, Mrs L. E. Gold, Mrs P. Goldsmith, V. F. Hancock, Mrs B. Hardwidge, E. C. G. Hardwidge, C. Harrington, L. Holyday, P. Julian, Miss M. E. Kennedy, R. Kettle, D. Martin, Mrs H. Morris, P. I. Morrison, A. F. Mussellwhite, Mrs B. S. Mussellwhite, Mrs J. D. Parr, R. F. Sanderson, T. R. Smeeton, P. S. Smith, G. Taylor, E. Venis, S. Walter, T. Walter, C. A. White, Miss D. E. Woods and Dr. D. W. Yalden. My apologies to any members inadvertently omitted.

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Obituaries

LORD HURCOMB, 1883-1975

The long and distinguished life of Cyril William Hurcomb, the first and only Baron Hurcomb of Campden Hill, has been recounted elsewhere, and it seems appropriate in *The London Naturalist* to dwell principally upon his connection with birds in London. Although born in Oxford on 18 February 1883 and brought up there until he left St John's College at the beginning of this century, the remainder of his long life was based on London, until he left it during his last illness in 1975.

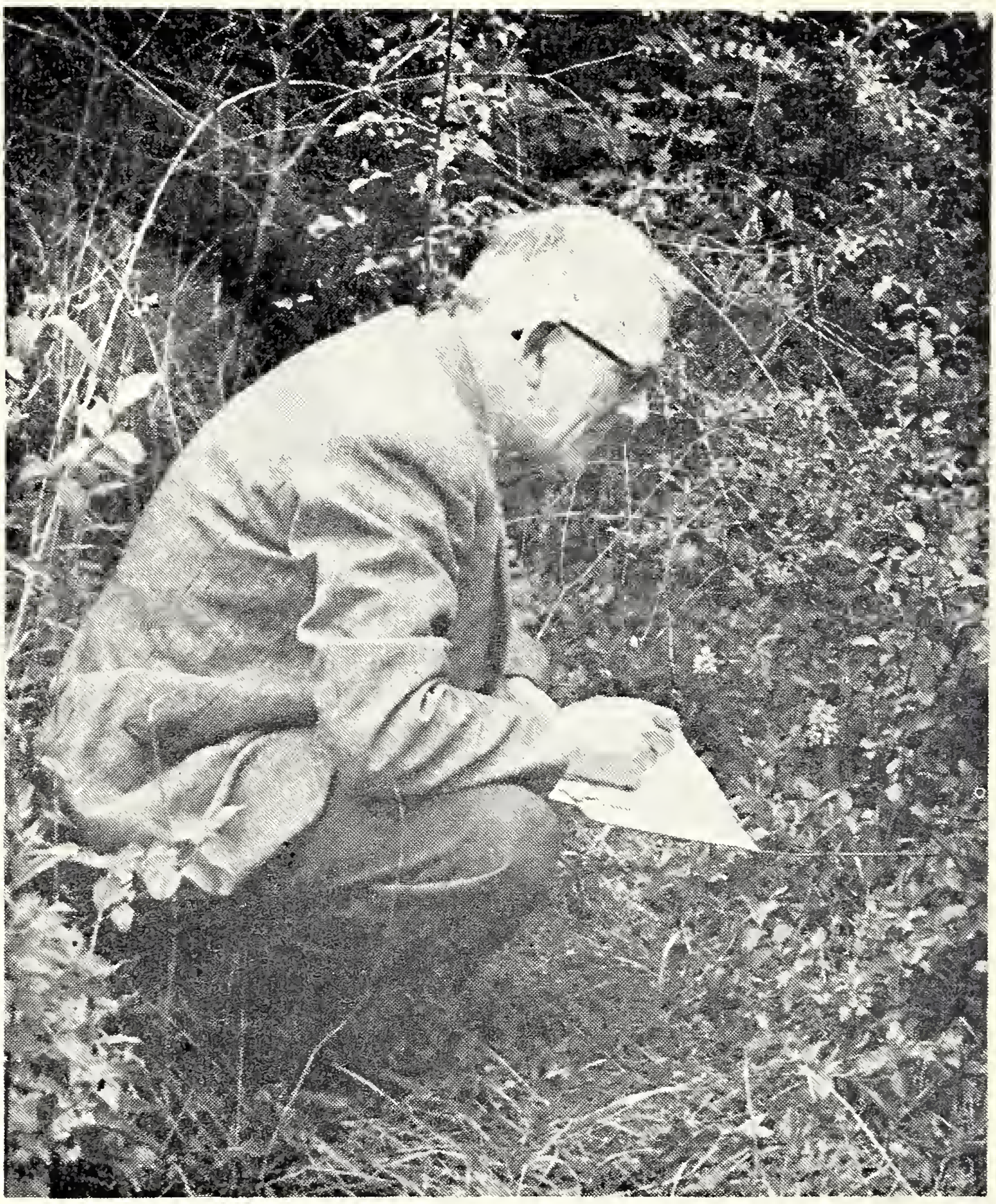
Interest in birds had been aroused in him in infancy and persisted throughout his life, but for him bird-watching was its own justification and reward; he never felt the urge to make lists, record observations or study particular species or aspects. Possibly this was due to his other lifelong devotion to fishing; as an angler he had endless opportunities of watching birds quietly on the banks of streams, and when he went bird-watching it was in the same spirit, and often still with a preference for the neighbourhood of water. He had a scholarly and elegant command of English, and had he been inspired to write of what he saw the result must have been notable; that is something which we miss from him.

He wisely preferred, however, from around the end of World War II, to devote his great gifts and prestige as an administrator to the promotion of conservation, and to reinforcing the conservation movement in its structure, its policy-making and in the training of a generation of leaders able to hold their own against political and economic pressures. In London his principal care was his chairmanship from 1947 to 1974 of the Committee on Bird Sanctuaries in the Royal Parks, which originally advised the Minister of Works and eventually the Secretary of State for the Environment. Under his guidance the committee appointed and encouraged some two dozen observers not only to keep detailed records of the gradually changing and diversifying bird life of the leading parks, but to be watchful about any activity or tendency which could harm or could foster that interest. Once a year the official observers assembled to present to him and his committee an account of their stewardship and a commentary on abuses, troubles or unsatisfied needs, reminiscent of a medieval lord's court. They were sure of a sympathetic hearing, and that anything serious which they brought to notice would be taken up at as high a level as necessary, even in the last resort to the Minister in person.

Such relaxed confrontations were characteristic of his cool judicial aspect, barely concealing the intense underlying concern and enthusiasm for nature, and the resolute skill in ensuring that it should prevail. Aware of his own limitations, and mistrusting hasty or prejudiced conclusions, he was a most patient listener and a gifted interpreter and bridger of differences and misunderstandings. At the same time he had a watchful eye for muddled reasoning and shaky inferences, and his readiness to appreciate conflicting viewpoints contributed to his successful advocacy of bird protection and of conservation generally in the House of Lords. In a sense, although by aptitude rather than heredity, he was born to the Upper House, and exemplified more than most its virtues of moderation, consideration, courtesy and thoughtfulness for people as well as for issues. He was indeed one of the few among his contemporaries who could be said to possess wisdom. In consequence he was in his later years in great demand to preside over a wide range of conservation bodies, national and international as well as regional, on all of which he left some mark. The society may feel satisfaction at having included among its Honorary Vice-presidents a man of such public distinction so deeply dedicated to natural history and to the care of nature.

E. M. NICHOLSON

J. Edward Lousley writing botanical notes in Buckinghamshire in 1955.
Photograph: T. G. Collett.



JOB EDWARD LOUSLEY, 1907-1976

Job Edward ["Ted"] Lousley died suddenly on 6 January 1976. The loss to the world of botany and conservation and to his many friends is immeasurable.

He was born in 1907. By profession he was a banker. Starting in local branch work at the age of 17 he rose to become Departmental Manager of the Trustee Department of Barclays Bank. His work here was with investments and he served on the Investment Advisory Panel of several county councils.

As a young boy he was interested in natural history, particularly botany, and he kept notebooks from an early age. Needless to say he was secretary of his school natural history society. He attended evening classes for his banking exams which he passed in record time. He then went on to study botany and foreign languages, the knowledge of which he found useful in both fields.

His natural history appointments were so extensive that only some of the post-1940 ones are mentioned here. He served the Botanical Society of the British Isles as Council member, Treasurer, Honorary Secretary, Vice-president and President. He was Honorary Secretary of the Council for Nature 1959–64 and Vice-president 1965–68. He served on the Nature Conservancy Committee for England. A founder member of the Surrey Naturalists' Trust he was Vice-president from its inception until his death. The South London Botanical Institute, where W. R. Sherrin had encouraged Ted as a botanist, knew him as President and he was first Chairman and then Editor and Recorder of the Surrey Flora Committee, a body which was formed at his instigation. For the London Natural History Society he was Chairman of the Botanical Section and Recorder for flowering plants from 1942, President 1963–64, and Vice-president from 1965.

All this sounds as if he spent his entire time sitting on committees which is far from the truth. He was a first class field botanist and travelled all over the country to see the plants growing in their native habitats. The London Area, of course, he knew particularly well and he was always ready to visit a new plant or check up on an old locality. He had acquired the largest private herbarium in the country. Nor did he confine himself to the British flora but studied and collected the alien species too, and was to be seen going home from a visit to shoddy fields with a bag of specimens to "grow on". He was the expert on the genus *Rumex* and at the time of his death was writing a handbook on Polygonaceae.

Ted was a constant contributor to scientific journals and his books *Wild Flowers of Chalk and Limestone* (1950) and *Flora of the Isles of Scilly* (1971) are widely read. Before his death he had completed the new *Flora of Surrey*, a work close to his heart for he was a man of v.c. 17, and knew the county intimately having botanised in it all his life. With D. H. Kent he was co-author of the *Hand List of the Plants of the London Area* published as a supplement to *The London Naturalist* from 1951 to 1957, a work to which many of us still constantly refer.

The war did not stop his fieldwork for he studied the flora of the bomb-sites and indeed discovered and described the hybrid *Senecio* x *londinensis* Lousley from one such site only 100 metres from his home.

He was an active conservationist. At the "Countryside in 1970" conferences he was a member of the working parties on Conservation and Derelict Land and Reclamation. On any conservation problem he could always tell you what to do, and how and when to do it.

Before his retirement he had started lecturing at Morley College giving courses on pre-retirement and finance. These expanded after he retired when he became a part-time lecturer in botany at Morley College and for the Extra-Mural Department of London University. His classes were always over-subscribed, many people booking in from one year to the next. He thus introduced many London residents to the pleasure and interest of field botany. He also led botanical holiday tours on the continent and in the Near East, which were as popular and as interest-rousing as were his lectures.

Ted was of a rather retiring nature, always ready to give advice if asked but never pushing himself forward. It is only now, after his death, that people who have known him 30, 40, even 50 years are saying "I never knew Ted did *that*". Indeed, I am aware there are facets of his life as a botanist which I have not mentioned, for he accomplished so much. Nothing was ever too much trouble. He was always willing to help beginners, name specimens, talk to local natural history societies, and chair meetings.

In 1963 he received the H. H. Bloomer award of the Linnean Society of London. This annual award is given alternately to an amateur botanist and zoologist who has made an important contribution to biological knowledge.

Ted leaves a widow and a married daughter to whom we extend our deepest sympathy.

His knowledge was so extensive and his achievements so numerous that I feel sure no one person can ever replace him.

JOYCE E. SMITH

Book Review

Flora of Essex. By Stanley T. Jermyn. 302 pages, 6 colour plates, 34 map plates. Essex Naturalists' Trust Ltd., Colchester. Published 1975 [date in book 1974]. £10.00.

This flora of Essex is a most attractive and lavish production which contains a great deal of background information about the county. The introduction includes an interesting account of climate and history and a comprehensive description of the geology. The geological account is supported by a fold-out map of surface geology inside the back cover, which is colourful and easy to follow.

There is almost a surfeit of maps in the introduction. The most useful of these show the recording area and parish boundaries, Gibson's earlier recording units, local natural history interests, structural features, soils and land-use. Some of the maps such as those showing the urban development and drainage provide a useful bonus. Among the three maps showing the physical features of the county only that of structural features has enough visual impact to be useful, while that of topography is confusing and pointless. Maps showing steep slopes and geomorphology seem superfluous, while the data on soil mechanics will be incomprehensible to the majority of readers.

The systematic list includes algae and vascular plants, with a separate section on the Bryophyta by Kenneth J. Adams. The account reflects a rich and varied flora which includes maritime species on the one hand and urban species on the other. Casuals have been incorporated into the main list to overcome the difficulty of deciding where to draw the line between established and adventive plants. The present survey lists 1700 species, including the *Rubi*, but excluding introductions. The *Rubi* have been dealt with quite thoroughly. Detailed accounts are given for the more interesting species, such as *Bupleurum falcatum.* Distribution maps appear throughout the text where they are most conveniently placed for reference purposes. These are dot maps which indicate records localised to 1, 2 or 4 one-kilometre squares. These three types of record are distinguished by the position of the dot within each tetrad. I should prefer to see three different symbols used here: round, triangular and square dots. A transparent overlay of the county and the national grid is provided in a neat card mount, but it must be aligned very accurately to determine just where the dots occur. This is loose and anyone who buys the flora would be well advised to make a pocket for it in the cover.

There is an appendix of maps showing records on 10 kilometre squares, which doesn't really provide enough information to justify its inclusion. The section on an analysis of the flora and recent changes could have been expanded. It is sad to see that many beautiful plants have been lost from the county, e.g. *Anemone pulsatilla*, *Otanthus maritimus* and *Orchis ustulata.*

There is an excellent 14 page gazetteer of place names and localities by Janet M• Adams which is a thoughtful inclusion for anyone who is unfamiliar with Essex. The colour illustrations are paintings of selected species by two artists which must enhance its popularity. The only omission is the lack of photographs of plants or habitats. Good habitat pictures add considerably to the value of a flora from the point of view of future reference.

This book will surely be an example to future flora writers. The whole production is attractive, informative and good value. I can do no better than echo the remarks of Colonel Sir John Ruggles-Brise in the foreword that this flora will serve as a fitting memorial to Stanley Jermyn.

J. L. Mason

Book Review

The Historical Flora of Middlesex. By Douglas H. Kent. viii + 676 pages, 5 plates. Ray Society, London. 1975. £15.00.

This volume is "an account of the wild plants found in the Watsonian vice-county 21 from 1548 to the present time". The flora is an exceptionally comprehensive collection of historical records and the list of recorders, which covers more than 11 pages, bears testimony to the author's thoroughness.

Middlesex would seem to be an unpromising county for flowers and yet there is a wealth of interest in this work which traces the changes that have taken place over the years in the face of urban development. The 78 species lost since 1869 include such gems as *Viola lactea* and *Orchis militaris*, but there are still some very nice plants such as *Ophrys apifera* and *Cyperus fuscus*.

The systematic list, which includes the Characeae and Bryophyta, is up to date with the current correct names, e.g. *Agrostis stricta* (=*A. canina* subsp. *montana*). Recent discoveries, such as *A. castellana* introduced with lawn seed, also appear. In the case of rare species the information on their occurrence is most detailed and useful, as with *Orchis militaris* for example.

Casual species are dealt with in a separate section of 47 pages. These always present flora writers with problems such as whether to include them in the body of the flora or as an appendix. If a separate section is used it is difficult to know where to draw the line. In this flora *Setaria viridis* and *Phalaris canariensis* appear in the systematic list as established on tips, whereas in most instances they are casuals. On the other hand *Hordeum jubatum* appears in the casual list although it is sometimes sown in permanent grass. In general the treatment is good and the casual list is better than in most other floras. It also includes some nice touches: who could resist *Brachiaria marlothii* recorded by D. N. Turner as growing "spontaneously in a pot of cacti in an office in Paddington"?

There will always be a divergence of opinion about what a flora should contain in the way of background information. In my opinion there are some extraordinary omissions. There is not a single map in the flora yet these are essential to indicate the area covered, the botanical districts and perhaps physical features, such as geology. A few good maps would make the distributions so much easier to understand. In a historical flora maps to show the main changes that have occurred would also have been very interesting. There is no gazetteer and again this would be most valuable for anyone who is not familiar with the county. The description of geology is rather superficial and it would be nice to see more detail here.

There are five plates which illustrate plants of interest in the county. These are competent enough black and white photographic portraits, but they seem strangely out of place in this flora. I would have preferred to see some old prints or illustrations which would have been more appropriate to the subject matter.

In conclusion this flora contains a wealth of information and will be a most useful reference work for anyone interested in the flora of the county. However it is definitely a book for the serious student as it is expensive and makes no concession to popular appeal.

J. L. Mason

Notice

The Statement of Affairs at 31 October 1975 is expected to appear in the next issue of *The London Naturalist*.

Instructions to Contributors

Submission of papers

Papers relevant to the natural history and archaeology of the London Area should be submitted to the editor, Mr J. R. Laundon, Department of Botany, British Museum (Natural History), Cromwell Road, London SW7 5BD, before the end of January if they are to be considered for publication in the same year. They should be typed, with double spacing and wide (three cm) margins, on one side of the paper. Authors must retain a duplicate copy. Papers should include at the beginning an abstract, summary or synopsis.

Text

Spellings are to follow *Chambers Twentieth Century Dictionary* 1972 edition; locality spellings should follow the latest editions of the maps published by the Ordnance Survey. Capitalisation should be kept to a minimum. Common names of animals and plants must begin with lower-case initials, and scientific names must be underlined. When both common and Latin names are given there should be no brackets or commas separating them. Genus names should appear in full where first used within each paragraph. In descriptive matter numbers under 10 should be in words, except in a strictly numerical context. Dates should follow the logical sequence of day, month, year (i.e. 25 December 1971). Measurements should be in metric and follow the SI system (Système International d'Unités), with imperial equivalents in parenthesis where appropriate. There should be no full point following Dr, Mr, Mrs or St. Lists should be in natural, alphabetical or numerical order.

References

Reference citation should be based on the Madison rules (in *Bull. Torrey bot. Club* **22**: 130-132 (1895)) except that a colon should always precede a page number. Capitalisation in titles of papers in journals should be kept to a minimum. Journal titles should follow the abbreviations in the *World List of Scientific Periodicals* and be underlined. Examples are as follows:

In text:

Meadows (1970 : 80). (Meadows 1970).

In references:

MEADOWS, B. S. 1970. Observations on the return of fishes to a polluted tributary of the River Thames 1964-9. *Lond. Nat.* **49**: 76-81.

MELLANBY, K. 1970. *Pesticides and Pollution.* Ed. 2. Collins, London.

WHITE, K. G. 1959. Dimsdale Hall moat, part II. *Trans. a. Rep. N. Staffs. Fld Club* **92**: 39-45.

Illustrations

Distribution maps should be submitted in the form of a Recording Map with symbols in Indian ink or Letraset. Solid dots are used to indicate contemporary or recent presence, circles for old records and crosses (not pluses) for other information, such as introduced species. Tetrad dots and circles should be 4·0 mm and tetrad crosses 5·0 mm, with a line thickness of 0·8 mm; all monad symbols should be 1·6 mm with a line thickness of 0·5 mm. The legend should be written outside the frame of the map and will be set up by the printer. The Mapping Schemes Secretary can provide Recording Maps, advice and dies for printing distribution symbols.

Line drawings should be in Indian ink on Bristol board, preferably twice the printed size. Place names, etc., must be produced with stencils or Letraset. Legends should be separate as they will be set up by the printer.

Photographs should be glossy black-and-white prints, of good contrast, preferably half-plate in size.

Proofs

Galley proofs will be sent to authors for scrutiny, but only essential corrections can be made at that stage.

Reprints

Up to twenty-five free reprints will be supplied on request. Additional copies may be purchased if ordered when the proofs are returned.

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